THE FARMERS' CABINET,
AND

AMERICAN HERD-BOOK.

DEVOTED TO

AGRICULTURE, HORTICULTURE, AND RURAL AND DOMESTIC AFFAIRS.

Perfect Agriculture is the true foundation of all trade and industry.—Liebig.

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For the Farmers' Cabinet.

Effect of Different Coloured Lights upon Plants.

Mr. Editor,—I take the following article from the Scientific American—an excellent paper published in the city of New York.

"The warmth of the sun has comparatively little to do with the specific action of his rays on the chemical functions of the plant, which is illustrated by the experiments of Mr. Hunt of the Royal Agricultural Society of England, on the effect of the rays of light of different colours on the growing plant. He sowed cress seed, and exposed different portions of the soil in which the seeds were germinating, to the action of the red, yellow, green, and blue rays, which were transmitted by equal thicknesses of solutions of these different colours. 'After ten days, there was, under the blue fluid, a crop of cress of as bright a green, as any which grew in full light, and far more abundant. The crop was scanty under the green fluid, and of a pale green unhealthy colour. Under the yellow solution only two or three plants appeared, but less pale than those under the green; while beneath the red a few more plants came up than under the yellow, though they were also of an unhealthy colour. The red and blue colours being now mutually transferred, the crop formerly beneath the blue in a few days appeared blighted, while on the patch previously exposed to the red, some additional plants sprang up.'

"Besides the rays of heat and of light, the sun-beam contains what have been called chemical rays, not distinguishable to our senses, but capable of being recognized by the chemical effects they produce. These rays appear to differ in kind, as the rays of different coloured lights do. It is to the action of these chemical rays on the leaf, associated with the blue light on the solar beam, that the chemical influence of the sun on the growth of the plant is to be ascribed, by the decomposition of the carbonic acid absorbed from the air by the leaf of the plant on the interior of the leaf, the retention of the carbon, and the rejection or omission of the oxygen contained in the carbonic acid of the plant, which is returned to the atmosphere, which carbon retained, uniting with the elements of water—hydrogen or oxygen,—absorbed at the same time by the roots, give rise to and furnish the elements for the formation of woody, cellular fibre, &c., and for which cause it is that '*if light be excluded, vegetation never produces a leaf or a stock.*'

"The decomposition of the carbonic acid contained in the atmosphere, and the emission of oxygen gas from plants, is determined by the solar light, pure oxygen gas is, therefore, separated by the action of light, and the operation is stronger as the light is more vivid. By this continued emission of vital air the Almighty thus incessantly purifies the air, and repairs the loss of oxygen occasioned by respiration, combustion, fermentation, putrefaction, and numerous other processes which have a tendency to contaminate this fluid, so essential to the vigor and comfort of animal life; so that, in this way, by the agency of light, a due equilibrium is always maintained between the constituent parts of the atmosphere."

It will be seen by the above account, that the blue rays contribute very greatly to the growth of plants. This is demonstrated by numerous and definite and well authenticated experiments. Judging from these results, if we place such plants as we desire to cultivate, under glass—as in hot-houses, &c.,—under such glasses as have a blue tinge, we may propagate them more rapidly, certainly, and productively, than in the usual manner. Hot-houses, &c., ought, therefore, to be glazed with blue glass, or else with glass that has been painted blue. If the glass is painted blue, care should be taken that the coat of paint should not be so thick as to entirely exclude the rays of light. A slight coat of very dark blue paint on the common hot-house glass, will, in all probability, be sufficient.

The use of blue glass, or common glass, painted blue, will, if used with good taste, add materially to the beauty of a building in which exotic plants are cultivated, as many varieties of blue are admired by most persons.

A thin dark blue curtain arranged between flower plants and the direct rays of the sun, would perhaps have a favourable effect on their growth. This could easily be done where the plants are grown in parlour windows, &c. I recommend our florists and others to try these experiments, and give the results to the public. I have no doubt of their success. Chemico.

For the Farmers' Cabinet.

Gentle Words.

I have observed that the editor of the Cabinet is not unfriendly to the outpourings of the "Nine," but loves to give his readers occasionally a taste of good poetry. I know not who is the author of the following stanzas—of the first three, I mean. I like the sentiment conveyed in them, but they appeared to me incomplete—the chain of ideas was not extended to embrace the most important link. I have ventured to add a fourth stanza to supply the deficiency—and I make this acknowledgment, that the author, whoever he may be, may not stand obnoxious to the charge of having perpetrated such an offence against the Muses. A.

A young rose in summer time
Is beautiful to me,
And glorious the many stars
That glimmer on the sea:
But gentle words and loving hearts
And hands to clasp my own,
Are better than the fairest flowers
Or stars that ever shone.

The sun may warm the grass to life,
The dew, the drooping flower,
And eyes grow bright and watch the light
Of autumn's opening hour—
But words that breathe of tenderness,
And smiles we know are true,
Are warmer than the summer time,
And brighter than the dew.

It is not much the world can give
With all its subtle art,
And gold and gems are not the things
To satisfy the heart;
But oh, if those who cluster round
The altar and the hearth,
Have gentle words and loving smiles,
How beautiful is earth!

And brighter still, if gentle words
Are whispered in the breast,
By Him whose healing balm can give
The burthen'd spirit rest.
Than gold or gems, or earthly friends,
More precious far are they;—
O then for these all-soothing tones,
Let's listen, day by day.

Gardening on the Bosphorus.

The following notes on the state of Horticulture around Constantinople, were not written for publication; but as they possess much interest, we take the liberty to copy them, knowing that they will be read with much gratification. Messrs. Hovey & Co. have forwarded the writer some of the finest kinds of American pears, apples, and peaches; and we have no doubt but their introduction into the sultan's garden will be the means of extending their cultivation into all the finer gardens on the Bosphorus,—and the Baldwin and Northern Spy apple be better known than even in the gardens of some of the highly civilized portions of Europe.—*Ed. Hovey's Magazine.*

"The sultan, a most amiable and generous person, has an extensive garden attached to his winter palace on the European side of the Bosphorus, as yet but new; and I wish

to furnish it with a few of our American trees, among which I have thought of a few sugar maples,—such as *we* make sugar from in Ohio,—hickory, (shell-bark, &c.), and our black walnut (fir),—there is abundance of what is called the white or English walnut here (regia),—oak, magnolia (that flowers),—I have seen the latter in Ohio, where it is much colder than here,—beech, tulip-tree, sassafras, catalpa, cranberry, &c. All of these, I believe, are wholly unknown here. The poplar, elm, persimmon, horse-chestnut, scrub-green oak, linden, and the usual fruit trees, (none of them very good,) are abundant, and, in the woods, the arbutus is common and very pretty.

"I may mention, that the climate here is very mild. There are snows during our winter, which commences in January and ends in April; but they last but a day or so, and soon melt away. The atmosphere during the winter and spring is *very* damp and chilly, and fires are indispensable. We have no good apples about here, near; but the cherries, plums, (large as hen's eggs, red, blue, and white,) and pears are good; so are the peaches; but neither of the two last are to be compared to ours of the United States. Of course, the grapes are excellent,—generally of a large white kind called *Tehauch* grapes; the large blue are also good, but too fleshy. Figs are also good, but not so abundant as in Smyrna. Almonds grow well here, English walnuts, filberts, chesnuts,—large but not very sweet,—and large strawberries in abundance. Medlars and persimmons grow here; the latter are from Trebizonde on the Black Sea, and *here* bear the name of Trebizonde dates. Among the garden ornamental trees, I may mention the acacia, of two kinds,—the one bearing small yellow flowers of a strong rich odor, and the other producing a light-red flower, like a floss of silk, and is called by the Turks '*Gul Ibrashim*,' or, the 'Rose-silk tassel tree.' The Turks have much taste for flowers, and their summer-houses are much ornamented about the steps with choice flowers in pots, and their gardens look beautiful to the passer-by. My office of interpreter to the legation leads me frequently to these summer retreats, and I cannot tell you how much I admire the taste shown for natural embellishments by those whom the world regards as scarcely half civilized.

"I was last autumn at Erzeroom, not far from the Persian frontier, where I procured a few flower-seeds, among which is the 'Morina Orientalis,' peculiar to that place, and named, by the French traveller Tournefort, after a friend in Paris. I have sent some of the seeds to the American Oriental Society, of your city, of which I am a member, for the Horticultural Society. I have some fruit kernels, and other seeds, which I will send you from Smyrna, with a few of this same Morina, and I beg you to try it. The climate of Erzeroom is cold, and the soil, where it grows, poor and stony; and on that side near its base, there is a beautiful crimson flower, the stalk about two feet and a half high. It is an annual. I will try and procure for you some cherry seeds from Cerassum, the country on the shores of the Black Sea, from which place cherries are said to have their origin. I do not hope to furnish you with any thing *better* than you already possess, but to give you some *varieties*.

Yours, J. P. B.,

Legation of the United States of America.

Constantinople, Oct. 8. 1847.

On the Blight of the Pear Tree.

It seems to have been taken for granted, by many persons, that the pear tree is subject only to one kind of blight. Hence have arisen the conflicting theories and speculations that have been published on this subject. Having no theory to maintain, and no speculations to offer, but such as are founded on facts, I propose to show that *insect-blight* is a disease distinct from *fire-blight* and *frozen sap-blight*.

By the term *insect-blight*, as here used, must be understood the sudden withering of the leaves, and the death of the limbs of the pear tree in summer, occasioned by the internal attacks of one or more of the insects, called *Scolytus Pyri* by Professor Peck. This kind of blight is common in New-England; but it does not appear to exist, or to have been observed, in the western states, where, however, blights of the pear tree, somewhat similar in progress, and equally fatal in termination, prevail more or less every year. Blights, which are not the result of insect attacks, inasmuch as insects have never been detected in the blighted limbs, occasionally affect pear trees in New England. Some of my own trees have been thereby destroyed; and the most careful examination has failed to disclose any trace of insect depredation in them. On the other hand, numerous opportunities for seeing the effects of insect blight, and of dissecting specimens of *Scolytus Pyri* from the blighted limbs, enable me to declare confidently that the diseases are specifically distinct from each other; as much so as small-pox and measles. It is not my purpose to discuss the question, whether fire-blight and fozen sap-blight, or winter-blight, be identical; the contrast between them and insect-blight being what is now to be attempted.

The effects of insect-blight begin to appear in June, and continue through July; but the foundation of the disease may be traced to the operations of the parent insect during the previous summer. If all the limbs that were killed by innsect-blight in the summer of 1847, could have been examined during the latter part of the summer of 1846, there would have been found insects in them, in the larva or grub state, eating their way from the buds, where the eggs were deposited, inwards, through the bark and sap wood. These insects continued the work of destruction till the following spring, when they were transformed to beetles, and finally came forth from their burrows. The insects, therefore, preceded the appearance of the disease nearly a twelvemonth; from which follows the inevitable conclusion, that the blight of the limbs was the natural consequence of their previous attacks.

To suppose that the female *Scolytus Pyri*, by anticipation, deposits her eggs only on those limbs which are to become affected by fire-blight, or by frozen sap-blight, is unwarrantable; because none of these insects have been found in limbs that have perished by these kinds of blight, and consequently none could have existed in them during the previous summer. Hence, it follows that these blights are not caused by the attacks of *Scolytus Pyri*.

Observation sufficiently proves that this insect attacks young and thrifty trees, exhibiting no visible signs of disease or decay. As the young *Scolytus* is found in limbs that were apparently in a thrifty state during the previous summer, the parent insect, though not indued with the power to foresee frozen sap-blight during the following winter, or fire-blight the next summer, must have had some instinctive perception of the nature and actual condition of the tree on which she deposited her eggs; and, in performing this act, she would not have been left to blind chance. As the *Scolytus* lays her eggs on sound and thrifty limbs, it follows that she does so from choice; and, hence, it is fair to conclude that she would not voluntarily lay her eggs on unhealthy or diseased limbs, so long as she could find those that were healthy. Therefore, the opinion is untenable that the insects, found within the diseased limbs of the pear tree, are not the cause of the disease, but that they are attracted thither by the previous existence of the disease.

It should be remembered that the *Scolytus Pyri* requires a year, or thereabouts, to complete its transformations. In those limbs that perished by insect-blight in the summer of 1847, the seeds of the fatal disease were sown by the parent *Scolytus*, in the summer of 1846. Those limbs that perished by fire-blight during the last summer, according to the theory of Mr. Cox and Mr. Ernst, must have been sun-struck during the same summer. Those limbs that perished by frozen sap-blight, according to the theory of Mr. Beecher, had their death blow dealt to them during the previous winter. If the theories advanced by the above named gentlemen be correct, as to the time of attack, the specific difference in these three cases of disease is obvious. The occurrence of the insects in limbs destroyed by fire-blight, or frozen sap-blight, would be an exception to the natural order of things. But, even on the unproven and unnatural supposition that insect-blight might, for a time, coexist with other blights, it is evident that the attack of the insects must have preceded the disease. Insect-blight, therefore, differs essentially and specifically from fire-blight and frozen sap-blight, in origin and duration.

"What can we reason but from what we know."

Had the history of the *Scolytus Pyri* been well known and duly considered, the blight produced by the attacks of the insect would never have been mistaken for fire-blight, or frozen sap-blight. The mistake has arisen from taking too much for granted, and from not considering the possibility or probability that diseases, having some symptoms in common, and alike ending fatally, might be really and essentially distinct from each other.

It may not be generally known that apple, apricot and plum trees are attacked by the *Scolytus Pyri*, though less frequently than pear trees. In the latter part of May, 1843, a piece of the limb of an apple tree, affected by the *Scolytus*, was brought to me for examination. It was twenty-eight inches in length, and three quarters of an inch in diameter at the lower end. Its surface bore the marks of twenty buds—thirteen of which were perforated by the insects; and, from the burrows within, I took twelve of the blight-beetles in a living state; the thirteenth having previously been cut out. In July, 1844, I took one of these beetles on a plum tree; and, in August following, I found a large number of them in some pieces of a blighted branch of the apricot.

To check the increase of this kind of insect-blight, it is not enough to cut off the infected limbs. The insects contained in these limbs must be destroyed; for, if they are suffered to make their escape, they will certainly continue to propagate the disease. To make sure of the destruction of the insects, every limb affected by them should be

cut off and immediately burned, as soon as the existence of the disease is discovered.

THADDEUS WM. HARRIS.

I am, dear sir, yours very truly,

Cambridge, Mass., Jan. 7, 1848.

Cranberries.

THE experiment of Capt. Winthrop Low of Essex, is one of great interest. It establishes the fact, so far as it can be done in one year, that cranberries may be raised in perfection, upon a dry upland soil, without artificial watering or the use of loam. The soil selected by Capt. Low was, most of it a sandy loam. It was perfect Indian corn land. The soil is porous, and would not retain water even if the ground were level. But it must be remembered, that in no part of the field can the water stand so as to keep the roots *saturated* any considerable time together. A small rill of water indeed passes through the field, but confined to a width not exceeding five feet, and usually not more than one foot.

As evidence of the completely upland nature of the soil, it may be stated that a row of white beans was planted between every two of cranberry vines, and although it has not been a good year for white beans, Capt. Low has harvested nine bushels from the one hundred and twenty rods, a fact, showing also, that the land is not lost to the cultivator even the first year, indeed that the bean crop has defrayed a large part of the expense.

The cranberry vines had put out runners in many cases from three to four feet long, and have all the marks and numbers of health and vigour. Sand was applied to about one half of the hills, but without any apparent advantage whatever. The attention of the committee was called particularly to this fact, because the experiments in Barnstable county seem to have been all made with sand, and it is there thought and declared to be indispensable.

There was no artificial watering. The cranberry sods were taken up, as appears by the statement below, on the 15th of May, and set out on the 16th, 18th and 19th. There was in that month (May) but two and seven-eights inches of rain. It could not have been the presence of water then, that caused every root without a single failure to live, and nearly every one to produce berries.

It should be borne in mind, however, by way of caution, that there has been more wet weather during the last six months, than the average of the previous four years, or indeed any of them. The whole quantity during the months of May, June, July, August, September and October last, is 25 3-4 inches; while during the same months in 1846, there was but 15 7-8 inches; though in 1845 the quantity was as great as this year, wanting 2 1-2 inches.

It should be recollected too, that this is the first year, and what the effect of the winter will be without the *indispensable presence of water*, as the Yarmouth Register would say, remains to be seen. At present the vines flourish like a green bay tree, and this, perhaps, is enough for the committee to say. The fact that the roots could be taken dripping from their native meadow bed, on the 15th day of May, put into a cornfield soil, and then with nothing but the rain of heaven upon them, in five short months to take root downward, and bear fruit upward, is most extraordinary.—*Mass. Ploughman.*

For the Farmers' Cabinet.

Agricultural Society of Newcastle County, Del., Hares Corner, Exhibition Ground, October 15th, 1847.

To the Committee on Open and Under Draining:

GENTLEMEN,—Draining is a subject of great importance to the agriculturists of this State, of which no notice has hitherto been taken by this Society. There is no State in the Union, except it may be Louisiana, in which more draining has been done, or where it has been attended with greater success than in Delaware. A great portion of the eastern, or Delaware front, of Newcastle county, from Naaman's Creek to Bombayhook, was formerly marsh, which has been reclaimed by embankments at great cost. These embankments are in some instances full twenty-four feet wide at the base, and six to eight feet high, sloping from the river side at least a foot and a half to one foot in height, and about one foot to one and a half on the land or inside; leaving the top about four feet wide. The earth for the construction of these embankments is generally taken from the outside, from ditches or pits cut perpendicular to the embankments—of length and depth, so as to afford a sufficient quantity of earth for that purpose. Great precaution must be taken when first locating these embankments, to set them sufficiently back from the river, that the growing reed may be a protection against the storms. Where they are exposed to the beating surf, they must be protected by heavy stone walls. Sluices of masonry or wood, of a capacity to vent all back water, should be constructed previously to putting up the outside embankments; and so ought the leading drains or

main open ditches. Several thousand acres of prime meadow now in good condition, are being grazed with fat cattle for the shambles of Wilmington, Philadelphia and New York. Besides which many dairies for milk, butter, and cream for the ice-cream saloons of Wilmington, Philadelphia and Baltimore. These meadows when thus improved, sell from 20 to $200 per acre, according to quality and facility for reaching market. For grazing purposes they are particularly well adapted. I was informed by John Ball, formerly an agent of Martin Dubbs, late of Philadelphia, that they fed twenty-four bullocks on only twenty-five acres on the St. George's meadows, near Port Penn, which cattle cost $40 and sold for $90 when fat, netting near $50 clear profit to the acre. The neatest and best arranged of these marsh farms that I have seen for a long time, was Long Island, owned and occupied then by John Barney, late of Philadelphia. It was then far more beautiful and profitably cultivated than was ever that of Blannerhassett, (situated as it is at the head of the broad and beautiful bay of Delaware, where in the hottest day of summer a sea breeze can always be enjoyed,) in the most palmy days of its proprietor. There is much other marsh yet in its wild state on Appoquinnimink, Black Bird, and Duck Creeks, in Newcastle, as well as on the creeks in the lower counties of Kent and Sussex, that might be equally well improved and profitably employed. The numerous steamboats now plying on the bay and inlets, add greatly to the advantages of marsh owners, as well as to the upland owner, as a quick, safe and cheap mode of conveying their several products to market.

In Kent and Sussex, besides some well improved river marsh meadows on the creeks leading up from the river, the western border of the State has much flat land, that has been brought into profitable cultivation by open ditches of great extent. This draining both in the interior and on the Delaware front of the State, is done by chartered companies. In one of these,—(the Marsh Hope, or Tappahanock, I am not sure which, companies;)—the ditch is near twenty miles long, varying in width from six to twenty-four feet, and from two feet at the upper part to sufficient depth to vent the water. These lands when once well drained, are equal in fertility with the lands of the great American bottom of Illinois, the *Eldorado* of the West, and are as well adapted to the growth of corn, rye, grass, &c. I was shown a field near the village of Vernon, a few weeks since, which my informant, Mr. Thorp, told me had been in corn for more than twenty years in succession without being manured, and was then supposed by some to yield fifty bushels of corn to the acre. His Excellency Gov. Thorp informed me, that he had gathered ninety-six bushels of corn from an acre of his meadows, which is pretty much the same quality as many of those reclaimed flat lands. The draining of these lands adds much to the beauty and health of the country and neighbourhood in which they lay, as well as to their wealth. Within a few years, many farmers of Newcastle county, have greatly beautified and increased the value of their lands, by under-draining. Amongst the most prominent that have come under my observation and notice, are Arley Lore of Appoquinnimink, W. J. Hurlock, Major Reybold, Dr. C. Noble, D. Veasey, J. L. Clayton, John Gregg and Bryan Jackson. Besides these, many others of whom I have no knowledge, have also availed themselves of this mode of improving their wet lands.

The most extensive and perfect experiment that has come under my notice, and to which I wish to call your attention particularly, is that of Bryan Jackson, who has some 4 or 5000 feet of perfect miry unsightly bog beautifully reclaimed. The process which he adopted was first to open a main and open ditch through or near the centre of the low lands, designed to be reclaimed, some four or six feet wide, and two to three feet deep, or of sufficient width and depth to carry off all rain and other surplus water. Into which open or main drain all his under-drains lead. The covered drains are started at the lowest part of the land designed to be drained by this process, at the main ditch, running perpendicular thereto, and extending as far into the fast land as to head off the springs; then following up the fast land in a general direction, parellel with the main open drain, taking care to head all *springs* carrying the bottom of the *main covered land drain* to a depth as nearly level with the bottom, of the main *open drain*, as to give a gradual descent —the slower the better so as to lead off all spring water. To lead off the water from the main covered or land drain, he has cut cross drains, from it to the open main drain, in a direction somewhat down stream, and at distances from each other sufficiently to completely drain the land. Some parts of the main covered drain on either side of the cripple, was cut full five feet deep. The drains were formed as far as I saw them, by three boards, one of which was laid flat on the bottom; the other two, after being cut so as to fit, are placed on their edges and brought together at the top, forming a triangular drain. The

top boards of the lowest part of these drains, were near two feet below the surface.

The whole of this work appears to have been done very similar to the plan laid down in Stephens' Book of the Farm, as now being republished in Skinner's Farmer's Library. By this mode of improvement in a few short months, an unsightly, and otherwise useless and unhealthy bog is reclaimed, the land cleared off and ploughed, and now the wheat is growing most luxuriantly. Recently, hollow tiles for under-drains have been used by some, and they bid fair to come into general use. They are about twelve or thirteen inches long. They are made in Cecil county on the farm of David Taylor, and sold at $11 per thousand. Mr. Taylor, who is a neighbour of mine, and lives on the Maryland side of Mason and Dixon's line, has several thousand feet of drain made with those tiles. Tiles for the purpose of draining are made in Wilmington, I think by W. Lovel. The cost of under-draining sunk sufficiently below the reach of the plough, say eighteen inches, costs 25 cts. per rod, exclusive of materials, whether of tile or plank.

From all that I have seen of draining, I think Bryan Jackson's is the best done, and if others think so, he will be deservedly entitled to the premium.

This is a subject which I think of great importance to the people of this state. Every acre of waste land that can be and is so reclaimed, is just so many acres added to our territory; and besides this, it adds to the beauty, health and wealth of the state.

Respectfully and truly yours,

J. Jones.

Communicated for the Farmers' Cabinet.

Suggestions which may assist in deciding whether Manures are more efficacious when "ploughed in," or used as a "top-dressing."

By Dr. Hare, Emeritus Professor of Chemistry in the University of Pennsylvania.

Communicated verbally, at a meeting of the Philadelphia Society for promoting Agriculture, on the 2nd inst.

It has been a question whether manures are prone to rise or descend, and consequently whether it be better to employ them as a top-dressing, or to turn them under the soil by the plough. Before discussing this question, it would seem expedient to consider the meaning of the word manure, originally derived from manus, which is the Latin word for the hand. Evidently the word manure may mean anything which the hand of man may so associate with a soil as to increase its fertility. Compounds, or aggregates, which have this qualification, owe their efficiency either to ingredients which they contain, or to products which they generate by fermentation, by a gradual union with the oxygen of the air, or reaction with other bodies previously existing in the soil or the atmosphere. The gradual union with the atmospheric oxygen is also called oxidation, slow combustion, or *eremacausis;* the last mentioned name has lately been given by Liebig, from Greek words of similar import. The word *rotting*, is ordinarily applied to the changes thus more scientifically designated. Among the results of the processes thus alluded to, are various carbonaceous products called *mould*, or more scientifically, *humus* or *geine*, with certain acids alleged to result from the latter. There also results ammonia and carbonic acid, which having a great tendency to combine with each other, are usually united, forming, of course, carbonate of ammonia: add to these sulphates, carbonates, and phosphates, either of potash, soda, lime, or magnesia, with free silicic acid, exemplified in its perfectly pure state by rock crystal: oxides of iron likewise are universally present, and together with charcoal, may contribute to fertility by attracting ammonia. Surely no chemist can, in allusion to this list of reagents, conceive them all, or any one of them, as prone invariably either to rise into the air or to descend into the soil. Either carbonic acid or ammonia, when free, would escape into the air, and when united as a carbonate, are still volatile. Yet either may be mixed or combined with the other ingredients of the congeries called earth. Ammonia especially unites with the aluminous or clayey portion into which it is carried by rain. Carbonic acid combines with water, and so does sulphuric acid. But whether united with water only, or with various bases, as, for instance, those of soda, potash, or lime, either are more or less soluble, and must tend to descend with water, unless arrested by absorption or decomposition. The earthy manure, such as slaked lime, carbonate of lime, phosphate of lime, silex and silicates, form a part of the soil, and of course are not likely to descend or to rise, their reciprocal coherence being much more powerful than any counteracting influence arising from difference of specific gravity, causing one to subside relatively to another. Enough has been said to show, that both ammonia and carbonic acid are less liable to be lost when liberated under a covering of moist earth, the clay of which has an affinity for ammonia, while the water attracts both.

Circumstances, however, must greatly vary the consequences of using manure as a top-dressing. The volatile portion, for which alone a covering of soil is desirable, arises, as above stated, from rotting, or *eremacausis;* and these changes take place more rapidly in proportion as heat and a *due* degree of moisture are supplied. Hence it follows, that during winter volatile products cannot be generated. Moreover, a top-dressing in winter may lie so long without losing any part of its virtue by fermentation, that by rains and alternate freezing and thawing, much of any manure consisting of dung, may be broken up; and impelled by the rain and its own gravity, may subside into fissures made by the frost, so that, when the warmth of the spring and summer sun comes to act upon the ground, the volatile matter may be yielded without so much exposure as to permit of its being carried away by the wind.

But again, diversity of inclination may cause the result to vary, as respects different fields. A hill side being frozen, the rain may carry off from it the manure by a mechanical force which, upon a horizontal plain also frozen, would not have this effect. The soluble portions of a manure would likewise be more liable to be washed away from the former than from the latter.

I have adverted to the fact, that a due degree of moisture is requisite to the processes of decomposition, by which some of the most fertilizing products of manure are generated. Moisture is almost invariably indispensable to fermentation, as well as any other process of organic decay or decomposition. There is no such thing as an absolutely "*dry rot.*" Well seasoned timber, in buildings where it is kept perfectly dry, lasts for ages. It is equally well known, that under water, wood has an unlimited durability. Of course a very moist, or a very dry season, must check the fertilizing emanations from manure.

In consequence of the difference of climate, it must be evident that a winter top-dressing is not likely to answer equally well in different latitudes, even when other things are equal.

Of course it will always be a question, how far the expense of ploughing and harrowing can be compensated by the greater efficacy which may arise from the soil being turned over the manure. It is obvious that the value of the sod is an important consideration where an old pasture is in question.

Agreeably to Liebig's recent views, as stated by Professor Horsford in a letter to Dr. Webster, the inorganic part of manure is that which is mainly important; so that the ashes of a load of dung would be as fertilizing as the whole, when spread upon the ground in its natural state. This seems to me an ultra doctrine, though I lean to his view of the subject. But if that view be correct, the volatile portions of manure being of secondary importance, there can be little motive for ploughing it under in order to prevent volatilization.

Feeding Stock.

A man who was noted for the excellence of his working oxen, once observed to the writer that he could seldom hire a man who was "fit to drive a yoke of good oxen to water." We think it is quite as difficult to find a man who is capable of *feeding* cattle or stock in a proper manner. There is generally a great deal of unnecessary waste. Some men will carry stock through the winter with half the quantity of hay or fodder that others will use, and yet the stock which has consumed least, will come out in the best order. To feed economically, the animal should have just the quantity he requires and no more—none should be given to be trampled under foot and left, unless it is intended for manure, without being first eaten. It is best, generally, to feed under cover, in clean mangers; though in dry weather coarse fodder, or that of an inferior quality, may be fed in mangers in the barn-yard, or on dry hard ground, or clean, hard snow. Coarse hay, clover and timothy (herd grass,) and corn stocks, had better be passed through a cutting machine, and if some bran, shorts, or a little meal can be added, the improved quality of the whole will render it much better relished by the animals, and they will, in their increased flesh or milk, repay the cost.

A good food for work-horses or oxen, is cut hay, with from three to six quarts of corn meal per day—regulating the quantity according to the degree of labour to be performed. Oats and corn ground together make a good provender. Moisten the hay, and mix the meal with it. If the labour is not severe, two quarts of meal with the hay, and the addition of a peck of carrots per day, will keep the horse in good condition. The carrots are good for the blood, and will improve the horse's health. Carrots are also valuable for milch cows—increasing the quantity and improving the quality of the milk.—*Exchange paper.*

During the month of December 5339 tons of ice were exported from Boston, of which 1782 tons were exported to foreign ports, and the balance to New Orleans and Mobile.

From the Horticulturist.

Profits of Fruit Culture.

Having seen in a late number of the Horticulturist, an account of a cherry tree that produced ten dollars worth of fruit in one season, permit me to give a chapter of facts on fruits, most of which are within my own personal knowledge.

C. A. Cable, of Cleveland, has an orchard of an hundred cherry trees, now twenty-two years old. In the year 1845, his crop sold for upwards of one thousand dollars. Mr. C. manages his orchard better than any other person in the Union, so far as my knowledge extends. The trees are planted out twenty-five feet apart, the ground kept properly enriched and cultivated, but no crop is put in.

Elisha Swain, of Darby, near Philadelphia, has the remains of a cherry orchard, numbering seventy trees, mostly of the Mayduke variety. In the height of the season, his sales amount to upwards of $80 per day. Mr. S., to ensure a good crop every season, digs in a horse-cart load of manure to each tree in autumn.

Hill Pennell, of Darby, has twenty apple trees, of the early Redstreak and Early Queen varieties, that stand on half an acre of ground. In 1846 these trees produced three hundred bushels of fruit, that sold in Philadelphia market for 75 cents per bushel, or $225 for the crop.

Mr. Pennell has a grape vine of the Raccoon [Fox grape] variety, that covers the tops of fourteen apple trees. It has never been pruned, but produces 75 bushels of grapes yearly, that sell for $1 per bushel. The apple trees produce good crops of fruit, and under the trees is produced a crop of grass; thus making three crops from one lot of ground.

James Laws, of Philadelphia, has a Washington plum tree, that produces six bushels of fruit yearly, that would sell in market for ten dollars per bushel. Five of the above plums weigh a pound.

Mr. Laws has a small vineyard of Isabella and Catawba grapes, near Chester, sixteen miles below Philadelphia, three-eighths of an acre of which came into bearing in 1845. The sales amounted to three hundred dollars at eight cents per pound, or at the rate of eight hundred dollars per acre from vines only four years old.

Brinton Darlington, of West Chester, Pa., has a Catawba grape vine, that produces ten bushels of grapes yearly. This crop is worth $40 at market price.

Jacob Steinmetz, of Philadelphia, has a Blue Gage plum tree, that produces ten bushels of fruit in a season, worth in market, $30.

My friend, *Ellwood Harvey*, Chaddsford, Pa., the present season, gathered thirteen quarts of gooseberries from one plant.

A gardener near Philadelphia, has two rows of gooseberry plants one hundred and fifty feet long. One afternoon he gathered with his own hands, six bushels of fruit, and the next morning sold them in Philadelphia market for $24.

A gentleman of Philadelphia having two apricot trees that produced more fruit than his family could consume, concluded to send the balance to market, and expend the money it would bring in purchasing wood for the poor. The amount thus sold for the benefit of the poor was $40.

Judge Line, of Carlisle, Pa., has had two Syrian apricot trees that have produced five bushels to each tree in a season. In the Philadelphia market, they would have commanded $120, in the New York market, $140.

Hugh Hatch, of Camden, N. J., has four Tewksbury Winter Blush apple trees, that in 1846 produced one hundred and forty market baskets of apples. Without any extra care, ninety baskets of these were on hand late in the spring of 1847, when they readily sold at $1 per basket.

The following facts relative to fruit growing near the North river, I have never seen published. Three years ago, Mr. Charles Downing, of Newburgh, N. Y., informed me that a fruit grower of his acquaintance in Fishkill Landing, N. Y., had gathered fifteen barrels of Lady apples from one tree, and sold them in New York for $45. The same gentleman you speak of, in your Fruits and Fruit Trees of America, as having sent to New York sixteen hundred bushels of plums in one season, has sent to New York apricots and received $14 per bushel for them. The above gentleman has often said that his plum trees, which are set out about the buildings, and take up but little room, pay him more profit than the whole of his valuable farm of two hundred acres. Another fruit grower in your neighbourhood, has sent four hundred bushels of Frost Gage plums to market in one season, and received $1200 for them.

Yet with all these facts before us, there is no full supply of any kind of fruit in the Philadelphia market, except peaches. Many farmers and gardeners neglect setting out fruit trees from a natural negligence; others dislike to pay fifty cents for a fine plum tree; others again are afraid that every body will go to fruit growing, and bring down the price to almost nothing. But we would ask, if there is any more danger of everybody com-

mencing on a large scale the culture of fruit, than there is that everybody will commence the raising of onions, or the making of razor strops, or the cultivation of roses?

Yours, etc., B. G. Boswell.

Philadelphia.

Chinese Agricultural Population.

There are few sights more pleasing than a Chinese family in the interior, engaged in gathering the tea leaves, or indeed in any of their other agricultural pursuits. There is the old man, patriarch-like, directing his descendants, many of whom are in their youth and prime, while others are in their childhood, in the labours of the field. He stands in the midst of them, bowed down with age. But to the honour of the Chinese, as a nation, he is always looked up to by all with pride and affection, and his old age and grey hairs are honoured, revered and loved. When, after the labours of the day are over, they return to their humble and happy homes, their fare consists principally of rice, fish and vegetables, which they enjoy with great zest, and are happy and contented. I really believe that there is no country in the world, where the agricultural population are better off than they are in the north of China. Labour with them is a pleasure, for its fruits are eaten by themselves, and the rod of the oppressor is unfelt and unknown.

I was one day travelling amongst the hills in the interior of the island of Amoy, in places where I suppose no Englishman had ever been before. The day was fine, and the whole of the agricultural laborers were at work in the fields. When they first saw me, they seemed much excited, and from their gestures and language, I was almost inclined to think them hostile. From every hill and valley, they cried, "*Wyloe-san-pan-fokie*," that is, "Be off to your boat, friend;" but on former occasions I had always found that the best plan was to put a bold face on the matter, and walk in amongst them, and then try to get them into good humor. In this instance the plan succeeded admirably; we were in a few minutes excellent friends, the boys were running in all directions gathering plants for my specimen box, and the old men were offering me their bamboo pipes to smoke. As I got a little nearer to the village, however, their suspicions seemed to return, and they evidently would have been better pleased had I either remained where I was, or gone back again; this procedure did not suit my plans, and though they tried very hard to induce me to "*wyloe*" to my "*san-pan*," it was of no use. They then pointed to the heavens, which were very black at the time, and told me it would soon be a thunderstorm—but even this did not succeed. As a last resource, when they found I was not to be turned out of my way, some of the little ones were sent on before to apprise the villagers of my approach, and when I reached the village every living thing, down even to the dogs and pigs, were out to have a peep at the "*Fokie*." I soon put them all, the dogs excepted—which have the true national antipathy to foreigners,—in the best possible humor, and at last they seemed in no hurry to get rid of me. One of the most respectable amongst them, seemingly the head man of the village, brought me some cakes and tea, which he politely offered me. I thanked him, and began to eat. The hundreds who now surrounded me were perfectly delighted; "He eats and drinks like ourselves," said one. "Look," said two or three behind me, who had been examining the back part of my head, "look here, the stranger has no tail!" and then the whole crowd, women and children included, had to come round and see if it was really a fact that I had no tail. One of them, rather a dandy in his way, with a noble tail of his own plaited with silk, now came forward, and taking off a kind of cloth which the natives wear here as a turban, and allowing his tail to fall gracefully over his shoulders, said to me in the most triumphant manner, "Look at that!" I acknowledged that it was very fine, and promised if he would allow me to cut it off, I would wear it for his sake. He seemed very much disgusted at the idea of such a loss, and the others had a good laugh at him.—*Fortune's Wanderings in China.*

For the Farmers' Cabinet.

Floors of Porticos.

Mr. Editor,—Will some of your scientific correspondents have the goodness to give information on the following subject, in which many of your readers are interested. Is there any substance or material, economical and durable, that would answer to cover the *floors* of porticos and piazzas, so as to be impenetrable by water and unchanged by the action of the atmosphere. A floor of boards tongued and grooved is not so, as the boards, though dry when put on, will change, swell and shrink, with the changes of the weather. Further, it is ascertained by experience, that the joints, after being puttied and painted, will, after a spell of wet weather, close and force out the putty; and the joints, after the boards again shrink, will be left open for the admission of water at the first dashing rain, to the injury of the ceil-

ing underneath, or perhaps things in the cellar, which are often put under porticos. It is desirable to know some cheap material, which, if put on the board floor, would answer the object desired—imperviousness to water as well as durability. Many substances have been suggested, yet not free from objections. Muslin or canvass spread over and well painted;—this, however, is considered too temporary. Tin or zinc have been suggested, but these would be too expensive when a large surface was to be covered, while at the same time they would be no effectual protection. Is there any form of caoutchouc that would answer the objects desired? If not, what else? Will the chemist or the scientific give the information, for which many will be grateful?

A Farmer.

Chester co., January 25th, 1848.

Geography and History of the Apple.

The Pyrus malus, or some of its varieties, grows spontaneously in almost every part of the northern hemisphere, except in the torrid and frigid zones, and some of the islands in the ocean. It is found throughout western Asia, China, Japan, North America, and in the north of Europe, as far as West Finland, in latitude 62°; in Sweden, in latitude 58° or 59°; and central Russia, to 55° or 60°. The crab of Europe, however, is wanting in Siberia, where its place is abundantly supplied by the P. m. prunifolia, and the P. m. baccata. In Britain, Ireland, and North America, the common apple-tree occurs wild, in hedges, and on the margins of woods. It is cultivated for its fruit, both in the temperate and transition zones of both hemispheres, even in the southern parts of India, on the Himalayas, and in China and Japan.

That the apple tree is a native of the eastern part of the world, we have the authority of the earliest writers in "Holy Writ," as well as of the naturalists of ancient Greece and Rome. The prophet Joel, where he declares the destruction of the products of the earth, by a long drought, mentions the fruits which were held in high estimation, and among thom, he names the apple.

> "The vine is dried up, and the fig-tree languisheth; the pomegranate-tree, the palm-tree, also, and the apple-tree, even all the trees of the field are withered."—*Joel* i. 12.

Apples are also mentioned by Theophrastus, Herodotus, and Columella; and the Greeks, according to Pliny, called them *Medica*, after the country whence they were first brought, in ancient times; but others conjecture that the term "Medica," was more probably applied to the citron and the peach, both of which are supposed to have been introduced from Media into Greece. That the *Epirotica*, from Epirus, were what we call apples, there can be no doubt; as they are described by Pliny, as a fruit with a tender skin, that can easily be pared off; and besides, he mentions "crabs," and "wildings," as being smaller, "and for their harsh sourness they have many a foul word given them." The cultivated apple, however, probably was not very abundant at Rome, in his time; for he states that, "there were some trees in the villas near the city, which yielded more profit than a small farm, and which brought about the invention of grafting." "There are apples," continues he, "that have ennobled the countries from which they came; and our best varieties will honour their first grafters forever; such as took their names from Matius, Cestius, Manlius, and Claudius." He particularizes the "quince apples," that came from a quince grafted upon an apple stock, which smelled like the quince, and were called *Appiana*, after Appius, of the house of Claudius. It must be confessed, however, that Pliny has related so many particulars as facts, concerning the apple—such as changing the fruit to the colour of blood, by grafting it on the mulberry; and the tree in the Tyburtines country, "grafted and laden with all manner of fruits," which are regarded by modern grafters as physiological impossibilities,—it would seem that very little confidence could be placed in his statements of any kind. But what reason have we to doubt the authority of a man, whose life was spent to the benefit of mankind, and whose death was caused by his perseverance in search of truth? Instances of grafting trees of different families upon one another, are also mentioned by other old authors, and even our Evelyn, of more recent times, states that he saw, in Holland, a rose engrafted upon the orange. Columella, a practical husbandman, who wrote some years before Pliny, describes three methods of grafting, as handed down to him, by whom he calls the "ancients," besides a fourth method of his own, and a mode of inarching, or grafting by approach, "whereby all sorts of grafts may be graffed upon all sorts of trees." It would appear, however, that the art of grafting, at the period in which he flourished, was comparatively a modern invention, as it is not mentioned by Moses, in his directions to the Israelites when they

> "* * * * * shall come into the land, and shall have planted all manner of trees;"

neither by Hesiod nor Homer, although

forming a part of the subjects on which they wrote.*

Whitaker, in his "History of Manchester," conjectures that the apple was brought into Britain by the first colonies of the natives, and by the Hædui of Somersetshire in particular; hence Glastonbury was distinguished by the title of "Avellonia" or apple orchard, previously to the arrival of the Romans. Before the third century, this fruit had spread over the whole island, and so widely, that, according to Solinus, there were large plantations of it in the "Ultima Thule." The manufacture of wine from the apple, appears to have occurred in Norfolk, at the beginning of the thirteenth century; for it is stated by Bloomfield, that, in the sixth year of King John, (1205,) Robert de Evermere was found to hold his lordship of Redham and Stokesly, in Norfolk, by petty sergeantry, the annual payment of two hundred pearmains, and four hogsheads of wine of pearmains, into the exchequer, at the feast of St. Michael. The making of cider was introduced into Britain by the Normans, who, it is said, obtained the art from Spain, where it is no longer practised. This liquor is supposed to have been first known, however, in Africa, from its being mentioned by the two African fathers, Tertullian and Augustine, and was introduced by the Carthagenians into Biscay, a province unfriendly to the vine, on which account it became the substitute in other countries.

Many of the better varieties of the apple were probably introduced into Britain from the continent, as the greater part of their names are either pure or corrupted French. Thus the "Nonpareil," according to old herbalists, was brought from France by a Jesuit, in the time of Queen Mary, and first planted in Oxfordshire. On the other hand, the celebrated "Golden Pippin" is considered as of British origin; and is noticed as such by French and Dutch authors. It is described by Du Hamel under the name of "Pomme d'or," "Reinette d' Angleterre," and "Grosse Reinette d' Angleterre." Pippins were probably very little known in England until towards the close of the sixteenth century. Fuller states that one Leonard Maschal, in the sixteenth year of the reign of Henry VIII., brought them from over sea, and planted them at Plumstead, in Sussex. They were called pippins, because the trees were raised from the *pips* or seeds, and bore the apples which gave them celebrity, without grafting.

The fine cider orchards of Herefordshire began to be planted in the reign of Charles I. The adaptation of the trees to the soil was soon discovered, and they spread over the face of the whole country. The cider counties of England lie something in the form of a horse-shoe, round the Bristol channel, the best of which are in Worcester and Hereford, on the north of the channel, and Somerset and Devon on the south. Of the varieties of the cider apples, the "Red-streak," and the "Sline," were formerly the most prized; and the cider of these apples, and the perry of the "Squash Pear," were celebrated throughout the kingdom. Some of the orchards occupy a space of forty or fifty acres, the produce of which is very fluctuating, and the growers seldom expect an abundant crop oftener than once in three years; and in a good year, an acre of orchard will produce about six hundred bushels of fruit.

The introduction of the common apple tree into the North American colonies, dates back to the earliest periods of their settlements. In the middle, northern, and some of the western States, no branch of rural economy has been pursued with more zeal, and few have been attended with more successful and beneficial results, than the cultivation of orchards. It was not undertaken on an extensive scale, however, until about the commencement of the present century, when experience had taught the hardy yeomanry of the soil, that "the moderate use of cider, as a common beverage, was highly conducive to sound health and long life." It appears from Dodsley's London "Annual Register," that in the year 1768, the Society for promoting Arts, &c., at New York, awarded a premium of £10 to Thomas Young, of Oyster Bay, for the largest nursery of apple trees, the number being 27,123. Between the years 1794 and 1808, Mr. William Coxe, of Burlington, New Jersey, enriched his lands in that vicinity with extensive orchards, containing in the aggregate several thousand trees, which occupied a space of seventy or eighty acres; and within and since that period, numerous other orchards have been planted in various parts of the country, equaling, and even surpassing them in extent. Among the largest, and perhaps the most select, are those of Mr. Robert L. Pell, of the county of Ulster, New York, which have been planted about twenty years, and are said to contain 20,000 trees. America, too, has given birth to several val-

* The art of grafting, as well as that of pruning, has been ascribed to accidental origin. The occasional natural union or inarching of the boughs of distinct trees in the forests, is thought to have first suggested the idea of grafting; and the more vigorous shooting of a vine, after a goat had browsed on it, is said to have given rise to the practice of pruning.

uable varieties of apples, which enter extensively both into her foreign as well as her domestic commerce, and are eagerly sought after in almost every civilized country of the globe. The most celebrated, and unquestionably the best variety extant, for shipping and for winter use, is said to have been the spontaneous production from a seed, more than a century and a half ago, in Newtown, on Long Island, near New York, and is well known by the name of "Newtown Pippin." The original tree stood on the estate owned at present by Mr. John J. Moore, of that town, and for a long time its fruit was called "Gershom Moore Pippin," in honour of its former proprietor. After enduring for more than one hundred years, it died, in about the year 1805, from excessive cutting and exhaustion. Its scions were in great request by all the principal amateurs and orchardists of the day, and engrafted trees of it are still to be met with in the neighbouring towns, which have stood beyond the "memory of man."* It is to be regretted, however, that the trees bearing this excellent variety of fruit, in many parts of the country, begin to manifest symptoms of decline; and it is believed by many, that the period has arrived in which nature is to terminate their existence, and like their parent stock, are about to pass into decrepitude and final decay.

As the longevity of the apple tree is comparatively limited, which is obvious from the perishable nature of its wood, there are but few very aged individuals to be met with, either in Europe or in America. The oldest trees of which we have received any account, are said to be growing near Plymouth, in Massachusetts, and are represented as being upwards of two centuries old. An ancient tree of the "Pearmain" variety also stands on the Charter Oak place, in Hartford, Connecticut, which was brought from England by Mr. George Wyllys, previous to the year 1645, and consequently must be more than two hundred years of age. Its trunk, though much decayed, still sends forth several thrifty boughs, which annually produce from two to three pecks of excellent fruit.

On the authority of Dr. James Mease, of Philadelphia, there is a mammoth apple tree at Romney, in Virginia, which grew spontaneously from seed, and is estimated to be fifty years old. It has attained a height of forty-five feet, with a trunk more than a yard in diameter, and a spread of branches of fifty-five feet. It is said to be in a flourishing condition, and continues to increase in size. In 1835, it produced 180 bushels of large fruit, besides four or five bushels left under its boughs as damaged, and several bushels, which, it was calculated, had been taken by visitors, in the course of the season; so that the total produce, in the opinion of Dr. Mease, amounted to nearly two hundred bushels.

The greatest quantity of fruit borne on a single tree, in England, in one year, that we have heard of, is recorded in Dodsley's "Annual Register," for 1777. It grew in the orchard of Mr. Hackman, of Littlefield, in Sussex, and produced 74 bushels of fruit, which, on being weighed, was found to average 14 pounds to each peck, and consequently the total product of the tree was nearly two tons.

The largest recorded apple tree in Britain, is at Herbert's farm, near Hereford, which, in 1836, was forty-eight feet in height, with a trunk five feet in diameter, and a spread of branches of forty-eight feet. —*Browne's Trees of America.*

* On the estate of Mr. Gardner G. Howland, at Flushing, there are several old trees of this description which bear abundantly every other year, and are supposed to be one hundred years of age.

On the Best Mode of Feeding Cattle.

BY PROFESSOR JOHNSTON.

THE following is the substance of a lecture delivered at Inverness, before the Highland Society of Scotland. After a few preliminary observations, the lecturer observed:

As a cattle importing district, therefore, the extension of sound information in regard to the economical use of food, must be of the very greatest importance; that is, in what way they could grow the greatest amount of beef or mutton at the least possible expense. This he was prepared to show was to be effected by the use of certain mixed food, and prepared food. An individual going from one end of the country to another to observe the state of agriculture, will look not merely at the kind of stock, but he will more particularly observe the implements of husbandry in use throughout the various districts. In order, therefore, to form an estimate of the degree of attention paid to this matter of prepared food in England, on his visit to Newcastle, at the great cattle show recently held there, he turned his attention particularly to the examination of the implements exhibited, having a bearing upon this point. Amongst these he found chaff-cutters, a peculiar machine for crushing corn and other seeds, and other instruments; all showing how much regard was being paid to this subject by practical men. There was no doubt but that the subject of the quantity of food which cattle require to produce a certain weight

of beef, was beginning to attract general attention; but before he entered upon the few points which he meant to notice in connexion with this question, perhaps it would be necessary to explain shortly the general composition of food. In all kinds of bread there were contained three different kinds of matter. First of all, there was a certain quantity of fat, which the butter they ate represented; secondly, there was a certain amount of sugar; and then there was besides, the third constituent, which was represented by the white of an egg. Now it was of the very greatest importance what description of food was used, and what proportion it contained of these three kinds of matter, as bearing upon the purpose it was intended to serve. Cattle had in their bodies different kinds of matter, also, but particularly flesh and fat; and the farmer should be sufficiently acquainted with the nature of food, to be able to distinguish what he should use when he wished to produce fat, or when he wished to produce fat and lean both together; and the food which was given would effect the one or the other of these purposes, according to its composition. The white of an egg or albumen would supply nothing, or nearly so, to the animal but muscle. The fat went directly to form fat. The starch in food kept the body warm, and when fat was wanted served the purpose of making the oily matter more readily become fat in the body of the animal.

Now, in fattening cattle, as in everything else, using the proper means produced the proper effects; and after the explanation which he had given, they would see at once that a mixture of food was better than the use of one kind alone. If they wanted to lay on muscle, they would feed with food containing the largest amount of gluten; and if they wanted to lay on the fat, they would give starch and oily substances, and only a small proportion of the other ingredient. Selecting food in any other way would not serve the purpose they had in view in the most economical way. He had a table representing the different proportions of fat in the food which they were in the habit of using; but he would illustrate what he had to say by a few simple illustrations. Wheat contained two per cent. of fat, and sometimes a little more; but oats contained sometimes from four to five per cent., or about double the amount which was to be found in wheat. Oats were next to Indian corn in this respect, the latter of which they were aware contained a large amount of fat. Gluten was the matter out of which the muscle was produced, and there was more of that substance in the bean or the pea, than in the oat; but the oat was better than wheat. But there was another kind of food used for fattening cattle, namely, oil-cake, which contained a greater amount of fat than the same weight of any other kind of grain. Linseed, from which oil-cake is made, differed from other descriptions of grain, in containing a greater amount of fat, and a larger amount of gluten likewise, with the exception of the bean. Now, practical men have derived great advantage from feeding their cattle on oil seeds; that food, from the peculiarity of its composition, laying on fat and muscle at the same time. Oil-cake, however, was the best food only when the greatest amount of fat was required; and according to the purpose which they had in view, farmers would give their cattle other descriptions of food. It was a remarkable circumstance, that the bean and pea contained very little fat, and as the wheels of the animal system required to be greased, these kinds of grain would not serve for that purpose, although they contained what made muscle. Although beans and peas were good food, therefore, they were not good as the sole food of animals. Besides, they would observe, that from their different constituents, plenty of oil seeds, and plenty of beans and peas, would be far more profitable than if they were to give either of them singly. That was the principle upon which the use of mixed food was founded—to give all the substances the animal required, and to give them at the cheapest rate; and the researches of the scientific man were directed to discovering the means by which these objects could be best accomplished. He had selected oil seeds, but he might have taken potatoes or turnips for his illustration.—*Amer. Jour. of Agriculture and Science.*

Rules for Selecting Cattle.

In selecting cattle for feeding, their qualities may be in some measure known by examining the hide, horns, &c. "It is well known that the grazier and the butcher judge of the aptitude that any aaimal has to fatten from the touch of the skin. When the hide feels soft and silky, it strongly indicates a tendency in the animal to take on meat; and it is evident that a fine and soft skin must be more pliable, and more easily stretched out to receive any extraordinary quantity of flesh, than a thick or tough one. At the same time, thick hides are of great importance in various manufactures. Indeed, they are necessary in cold countries, where cattle are much exposed to the inclemency of the seasons; and, in the best breeds of Highland cattle, the skin is thick in propor-

tion to their size, without being so tough as to be prejudicial to their capacity of fattening. It appears, from Columella's description of the best kind of ox, that the advantage of a soft skin is not a new discovery, but was perfectly well known to the husbandmen of ancient Italy." These are the observations of Sir John Sinclair, who adds the following as a summary of good points to be attended to in choosing cattle. They should be—1. Of a moderate size, unless where the food is of a nature peculiarly forcing; 2. Of a shape the most likely to yield profit to the farmer; 3. Of a docile disposition, without being deficient in spirit; 4. Hardy, and not liable to disease; 5. Easily maintained, and on food not of a costly nature; 6. Arriving soon at maturity; 7. Producing considerable quantities of milk; 8. Having flesh of an excellent quality; 9. Having a tendency to take on fat; 10. Having a valuable hide; and, lastly, Calculated (should it be judged necessary) for working." It is thought best to begin to break-in oxen at three years old, and to give them full work at four.

With respect to judging of cattle by their horns and teeth, we offer the following observations from the "Cyclopædia of Practical Husbandry, by Martin Doyle," (Rev. Mr. Hickey).

"The ordinary guide for ascertaining the precise age of cattle is the horn, which is also indicative of the breed; at three years old (this is laid down as a rule) the horns are perfectly smooth, after this a ring appears near the root, and annually afterwards a new circle, so that, by adding two years to the first ring, the age is calculated; but the contributors to the volume so frequently quoted, have clearly shown that this is a very uncertain mode of judging; 'that the rings are only distinct in the cow;' and that, 'if a heifer goes to the bull when she is two years old, or a little before or after that time, there is an immediate change in the horn, and the first ring appears, so that a real three-year old would carry the mark of a four years old.' 'In the bull they are either not seen until five, or they cannot be traced at all;' nor in the ox do they 'appear until he is five years old, and they are often confused;' besides, 'there is also an instrument called a rasp, which has been said to make many an arm ache a little before a large fair.' Without any delusive intentions, however, an ugly set in the horns of young cattle is often remedied by filing a little off the sides of the tips opposite to the direction which it is desired that the horns should take.

Some men have an antipathy to horns altogether, and would even carry their dislike so far as to extirpate them from the brows of all their cattle; they can indulge their taste by paring off the tops of the horns when they first break through the skin. Perhaps it is not generally known, that the larger the horn the thinner the skull.

The age is indicated with unerring certainty by the teeth, to those who have judgment and experience, until the animal reaches the age of six or seven; until two years old, no teeth are cast, at that age two new teeth are cut; at three, two more are cut; and in the two succeeding years two in each year; at five the mouth is said to be full, though not completely so until six, because until that period the two corner teeth (the last in renewal) are not perfectly up. The front, or *incisor* teeth are those considered, for a full grown beast has altogether thirty-two teeth."

METHOD OF ASCERTAINING THE WEIGHT OF CATTLE WHILE LIVING.

"This is of the utmost utility for all those who are not experienced judges by the eye, and by the following directions, the weight can be ascertained within a mere trifle:—Take a string, put it round the beast, standing square, just behind the shoulder-blade; measure on a foot-rule the feet and inches the animal is in circumference; this is called the girth; then, with the string, measure from the bone of the tail which plumbs the line with the hinder part of the buttock; direct the line along the back to the fore part of the shoulder-blade; take the dimensions on the foot-rule as before, which is the length, and work the figures in the following manner:—Girth of the bullock, 6 feet 4 inches; length, 5 feet 3 inches; which, multiplied together, make 31 square superficial feet; that again multiplied by 23 (the number of pounds allowed to each superficial foot of cattle measuring less than 7 and more than 5 in girth), makes 713 pounds; and, allowing 14 pounds to the stone, is 50 stone 13 pounds. Where the animal measures less than 9 and more than 7 feet in girth, 31 is the number of pounds to each superficial foot. Again, suppose a pig or any small beast should measure 2 feet in girth, and 2 feet along the back, which, multiplied together, make 4 square feet; that multiplied by 11, the number of pounds allowed for each square foot of cattle measuring less than three feet in girth, makes 44 pounds; which, divided by 14, to bring it to stones, is 3 stone 2 pounds. Again, suppose a calf, a sheep, &c., should measure 4 feet 6 inches in girth, and 3 feet 9 inches in length, which, multiplied together, make 16½ square feet; that multiplied by 16, the number of pounds allowed to all cattle mea-

suring less than 5 feet, and more than 3 in girth, makes 264 pounds; which, divided by 14, to bring it into stones, is 18 stones 12 pounds. The dimensions of the girth and length of black cattle, sheep, calves, or hogs, may be as exactly taken this way as it is at all necessary for any computation or valuation of stock, and will answer exactly to the four quarters, sinking the offal, and which every man, who can get even a bit of chalk, can easily perform. A deduction must be made for a half fatted beast of 1 stone in 20, from that of a fat one; and for a cow that has had calves, 1 stone must be allowed, and another for not being properly fat."*—*Chambers's Information for the People.*

Advice to Parents.—My father liked to have, as often as he could, some sensible friend or neighbour to converse with him, and always took care to start some ingenious or useful topic for discourse which might tend to improve the minds of his children. By this means he turned our attention to what was just and prudent in the conduct of life, and little or no notice was ever taken of what related to the victuals on the table; so that I was brought up in such a perfect inattention to those matters, as to be quite indifferent what kind of food was set before me. In after life this has been a great convenience to me; for my companions are often very unhappy for want of a suitable gratification of their more delicate tastes and appetites.—*Franklin.*

The Journal of Health says that a person accustomed to undress in a room without a fire, and to seek repose in a cold bed, will not experience the least inconvenience, even in the severest weather. The natural heat of his body will speedily render him even more comfortably warm than the individual who sleeps in a heated apartment, and in a bed thus artificially warmed, and who will be extremely liable to a sensation of chilliness as soon as the artificial heat is dissipated. But this is not all; the constitution of the former will be rendered more robust, and far less susceptible to the influence of atmospherical vicissitudes, than that of the latter.

Report of an Experiment with Special Manures, as applied to the Growth of Turnips in the Summer of 1846.

Charles Barclay, Esq., Bury Hill.

Sir,—In compliance with your request, I beg to present you with a Report of the experiments made with special manures for the growth of turnips, on your estate during the last summer.

In order that the nature of the several experiments may be the better understood, and consequently a more correct estimate formed of their different results, I will state as briefly as possible the nature of the soil, the course of cropping which it had previously undergone, and the preparatory cultivation of the land for the crop; together with any other attendant circumstances which may serve to illustrate the subject.

The nature of the soil in question, is a light blowing sand, very shallow, with a considerable quantity of rubbly surface stones, resting on a subsoil of sandstone rock. In point of quality, I believe I am justified in saying, it is almost as poor as any land in the county of Surrey. The part of the farm chosen, on which the trial took place, was a field of ten acres in extent; an old ley of three years standing, the layer commencing immediately after a crop of oats. The land was broken up with the plough as deep as it was possible to go, in the autumn of 1845. In the following April, the land was again ploughed, in an exactly opposite direction to that taken in the autumn. The plough was never again used, the cultivation being completed by the use of Biddel's scarifier; the couch and roots of the grasses were collected by Grant's lever horse-rake, some small part of which was burnt on the land for the sake of expedition, and the remaining greater portion carted to the yards.

From the backwardness of the season, and the multiplicity of work which necessarily attends an extensive breadth of turnips, the sowing was delayed till the 22nd and 23rd of July. The seed and manure were deposited by a drill manufactured by Smyth, of Suffolk, worked by two horses, drilling three rows at 18 inches apart at each breadth. The kind of seed the "Red Round."

The field was divided into ten portions, containing an acre in each; but owing to some part of the manure not being sufficiently dry to work quite properly, the divisions first made were necessarily altered, which will account for there being but nine portions mentioned below.

I here subjoin a tabular statement of the quantities and kind of manure applied to each portion; together with the cost of each, and also the weight of the whole produce per acre. It should be observed that the field was as nearly as possible of uniform quality; and the cultivation, both previous and subsequent to the sowing, on all parts exactly alike.

* Cattle Keeper's Guide.

A Particular of the quantity and description of dressings applied for the growth of Turnips on the Ten Acre piece of Land at Merriden; with the cost of each kind, and the weight of the produce per Acre.

No. of the Piece of Land.	Quantity of Land contained.	Descriptions of the dressings applied.	Quantity of each kind used with their respective costs.		Cost per Statute Acre.	Weight of Roots per Statute Acre.	Weight of Tops and Tails per Acre.	Total Weight of Produce per statute Acre.
	a. r. p.			£ s d	£ s d			
1	1 " "	Crushed Bones and Turf Ashes.	8 Bush. Bones 2s. 6d. 16 " Ashes 5d.	1 " " " 6 8		T C Qr lb	T C Qr lb	T C Qr lb
				1 6 8	1 6 8	9 1 3 20	3 0 2 16	12 2 1 36
2	1 " "	Crushed Bones, Turf Ashes, Nitrate Soda, and Nitrate Potash.	8 Bush. Bones 2s. 6d. 16 " Ashes ½ cwt. Soda 23s. ½ cwt. Potash 33s.	1 " " " 6 8 " 11 6 " 16 6				
				2 14 8	2 14 8	10 1 1 20	3 0 1 4	13 1 2 24
3	1 " 30	Crushed Bones, dissolved in Sulphuric Acid, Turf Ashes, and African Guano.	4 Bush. Bones, 84 lbs. Acid 1d. 16 Bush. Ashes. 1 cwt. guano £8 10s.	" 10 " " 7 " " 6 8 " 8 6				
				1 12 2	1 7 1	12 0 2 24	3 1 2 24	15 2 1 20
4	1 " 30	Crushed Bones dissolved in Sulphuric Acid, Turf Ashes, African Guano, Nitrate of Soda, & Nitrate of Potash.	4 Bush. Bones, 84 lbs. Acid 1d. 16 Bush. Ashes, 1 cwt. Guano, ½ cwt. Soda, ½ cwt. Potash,	" 10 " " 7 " " 6 8 " 8 6 " 11 6 " 16 6				
				3 " 2	2 10 8	14 1 1 4	5 0 1 4	19 1 2 8*
5	1 " "	Muck of an Ordidinary kind, African Guano, & Turf Ashes.	8 Cart loads of Muck at 4s. 3 cwt. Guano, 20 Bush. Ashes	1 12 " 1 5 6 " 8 4				
				3 5 10	3 5 10	13 1 2 24	5 0 0 0	18 1 2 24
6	1 " "	Muck, African Guano, Turf Ashes, Nitrate of Soda & Nitrate of Potash.	8 Loads of Muck 3 cwt. Guano 20 Bush. Ashes ¼ cwt. Soda ¼ cwt. Potash	1 12 " 1 5 6 " 8 4 " 11 6 " 16 6				
				4 13 10	4 13 10	13 1 0 10	4 0 0 16	17 1 0 26
7	1 " 30	Muck, Crushed Bones dissolved in Sulphuric Acid and Turf Ashes.	8 loads of Muck 4 Bush. Bones 84 lbs. Acid 16 Bush. Ashes	1 12 " " 10 " " 7 " " 6 8				
				2 15 8	2 6 0	7 1 2 26	3 0 1 20	10 2 0 18
8	1 " 30	Muck, Crushed Bones dissolved in Sulphuric Acid, Turf Ashes, Nitrate of Soda, & Nitrate of Potash.	8 Loads of Muck 4 Bush. Bones 84 lbs. Acid ¼ cwt. Soda ¼ cwt. Potash	1 12 " " 10 " " 7 " " 11 6 " 16 6				
				3 17 6	3 4 10	12 " " "	3 1 1 4	15 1 1 4
9	1 1 "	Muck, Crushed Bones dissolved in Sulphuric Acid, Turf Ashes, and African Guano.	8 loads of Muck 4 Bush. Bones 84 lbs. Acid 1½ cwt. Guano 16 Bush. Ashes	1 12 " " 10 " " 7 " " 12 9 " 6 8				
				3 8 5	2 14 8	12 1 2 20	3 1 3 8	15 3 2 0

* By measure, 820 bushels per acre, weighing 40 lbs. per bushel.

The weight of top and tail per acre may seem small in proportion to the weight of roots; but it must be remembered, that the weighing took place immediately after a month's unusually severe weather, the land being at a considerable elevation, and very much exposed. The crop was hand-hoed twice, and thrice horse-hoed.

On all the portions where dissolved bones were used, the plants came forwarder to the hoe than where they were not used; but beyond this there was not much perceptible difference in the appearance of the different parts, until from a month to six weeks had elapsed, when No. 7 began to grow less rapidly than the rest. At the end of between seven and eight weeks, No. 1 began to fall off; and in a few days No. 2 followed. Further than this difference, the eye could hardly detect where the separation of each kind of dressing took place.

It will doubtless be looked upon by some as rather a curious account; but I am persuaded that it is by making experiments such as these we shall *practically* arrive at that knowledge so much to be desired, viz., *the specific dressing which each crop requires, and how this shall be varied to suit the different descriptions of soil.*

The crop of turnips, which, by the bye, are considered exceedingly good, are now being fed off on the land; after which, it will be sown with barley, cow grass following. The growth of these crops will be narrowly watched, and any particular effects which may be noticed will be reported at a future period.

I am, Sir,

Your very obedient humble servant,

Thomas Page.

Holmwood Farm, Dorking, Surrey,
11th of February, 1847.

Heated Rooms.

Complaints of dizziness and headache are common during the winter among those occupying close heated rooms, and the complaints are most common among females, because they are most confined. To remove, in part, the cause of these unpleasant sensations, follow the hints of the following paragraph:

Rooms heated with anthracite coal, and rooms heated with coal stoves, in which wood is burnt, have very dry atmospheres. The use of water in such rooms is very congenial to health, but the water should not be placed in an iron or tin vessel upon the stove, for the reason that it will undergo that degree of heat which will make its vapors offensive and injurious to breathe. It is as injurious to the human system to breathe putrid water vapors of this kind, as it is to breathe the vapors from stagnant pools in hot weather. If water is used upon a simple stove, an iron pan should be made use of, and this filled with dry sand, in the sand set an earthen bowl filled with clean water, which should be changed twice a day, and the bowl washed and kept as clean as if used for a drinking vessel.

Where hard coal is burned in a grate, a glass globe should be suspended in the room filled with clean pure water, and as the heat rises to the top of the room, it will steadily evaporate the water and moisten the dry and heated air. Persons who prefer the atmosphere of salt water vapor can add salt to the water, or if they prefer an aromatic atmosphere, they can add cologne water, or any other perfume which they prefer. It is as important to have clean air for breathing as to have clean water for drinking. Basement rooms where hard coal is burnt, should be frequently ventilated. Small children accustomed to stay in basement rooms find a bad air near the floor. The air should be removed by allowing the doors to be opened frequently to let in fresh air. A little care in these matters will tend wonderfully to comfort and enjoyment.—*Pa. Enquirer.*

Agriculture.—Andrew Stevenson, once speaker of the House of Representatives, and afterwards minister to England, in an address on agriculture in Virginia, says:

"What occupation more full of dignity, duties more full of joy, than those which distinguish the husbandman! When was it that man ever rose from a state of servitude and dependence to proprietorship of land and its cultivation, that he did not learn self-respect and become more elevated in his own esteem! Then it is that an entire change takes place. Then it is, that breathing no low or abject spirit, he reaps from the soil a harvest of virtues. The sobriety of the father—the economy of the mother—the devoted labour of the son—the virtue of the daughter—these, these are the fruits of glorious agriculture. And this is my answer to all who decry it. I pity those who know nothing, or are incapable of enjoying that soothing, cheering, and unsurpassing influence which agriculture sheds over the mind and heart of man.

"O! friendly to the best pursuits of man;
Friendly to thought, to virtue, and to peace,
Domestic life in rural leisure passed!"

Translated for the Farmers' Cabinet.

On the distribution of Mineral substances in different parts of Plants, by C. Rammelsberg.

From Annal. de Poggendorff, translate ind the Journal de Pharmaciet de Chimie.

The chemical examination of colza and peas, has conducted M. Rammelsberg to the following interesting results, viz. that the substances contained in the grain, differ both in quality and quantity from those found in the straw.

The seed of colza and of the pea contain potash without a trace of soda. In the straw on the contrary he has found both alkalies, the soda predominating. Both plants contain lime and magnesia; the first abounding in the straw, the latter in the seed. Phosphoric acid, which is an essential part of the seed, is found in the straw in but very small quantities: thus for example, the seed of colza contains eight times, and peas three and a half times as much phosphoric acid as the same weight of the straw of these plants. The proportions of minerals and sulphates is the reverse of this: the straw presenting them in considerable quantities, while but very minute portions are found in the seed. This is also true of the carbonic acid produced by the incineration of the organic parts. The following are the results of the experiments of M. Rammelsberg.

I. Colza.	Seed.	Straw.
Potasse,	25.18	8.13
Soda,		19 82
Lime,	12.91	20.05
Magnesia,	11.39	2.56
Peroxide of Iron,	0.62	
Posphoric Acid,	45.95	4.76
Sulphuric Acid,	0.53	7.60
Carbonic Acid,	2.20	16.31
Muriatic Acid,	0.11	19.93
Silica,	1.11	0.84
	100.00	100.00

II. Peas.	Seed.	Straw.
Potash,	43.09	8.20
Soda,		12.50
Lime,	4.77	30.53
Magnesia,	8.06	6.93
Peroxide of Iron,		
Phosphoric Acid,	40.56	9.21
Sulphuric Acid,	0.44	7.01
Carbonic Acid,	0.79	16.36
Muriatic Acid,	1.96	7.15
Silica,	0.33	0.62
	100.00	100.00

Ashes form 100 parts of each substance.
From the Colza, seed, 4.54, straw 5.21.
From the Peas, seed, 3.28, straw, 4.15.

In these experiments the vegetable substances were carbonized at a gentle heat in a covered crucible, to avoid loss and decomposition; the charcoal, reduced to a fine powder, was washed with boiling water, and the extract submitted to special examination. The remaining charcoal was treated with muriatic acid, was well washed, dried and incinerated, and the ashes added to the acid solution. The carbonic acid, sulphuric acid and chlorine were determined separately. The following is the composition of the soluble portion contained in 100 parts of the preceding:

I. Colza.	Seed.	Straw.
Potash,	3.08	7.53
Soda,	"	18.63
Lime,	"	"
Magnesia,	"	"
Phosphoric Acid,	1.74	"
Sulphuric Acid,	0.53	7.60
Carbonic Acid,	0.42	4.77
Muriatic Acid,	0.11	19.93
	5.88	58.46

II. Peas.	Seed.	Straw.
Potash,	7.47	6.74
Soda,	"	9.90
Lime,	0.03	0.29
Magnesia,	0.15	0.15
Phosphoric Acid,	2.10	0.64
Sulphuric Acid,	0.44	5.30
Carbonic Acid,	0.79	4.75
Muriatic Acid,	1.96	7.15
	12.94	34.92

The preceding numbers do not, of course, represent the entire quantity of soluble parts, for the structure of vegetable charcoal does not permit their complete extraction, especially those contained in the seed.

M. Rammelsberg concluded his paper with a review of the principal results heretofore obtained by other chemists in their analysis of the different parts of maize, wheat, rye, barley, oats, and of the pine. He thought, at present, it would be premature to draw general conclusions from the analysis, yet would call attention to the constant presence and large proportion of phosphoric acid in the seed, whilst it was found in but small quantity in other parts of vegetables. In like manner, lime is especially abundant in the straw and in wood, while magnesia is met with in the seed.

Lord Leicester.

The following extract from the Speech of Andrew Stephenson, our late minister to England, delivered at a meeting of the Agricultural Society of Albemarle, Va. is taken from the number for last month of *Skinner's Farmer's Library.*

And here, Mr. President, I cannot forbear alluding to one extraordinary and distinguished farmer of England, to whom not only she, but the whole world, are indebted, as one of the greatest patrons of Agriculture, and benefactors of man. I allude to the late Lord Leicester, better known as Mr. Coke, of Holkham, the great farmer commoner of England and the devoted friend of America and all Americans. I can speak of him and his farms, with some degree of accuracy, as it was my good fortune to obtain his friendship and regard, during my residence in England, and spend many weeks with him in the country. This celebrated Holkham estate, (or rather farms, for it is divided into many,) contains many thousand acres. The house, one of the most magnificent piles of architecture in the kingdom, covers an entire acre of ground; the immediate pleasure grounds ten acres, and the park eight or nine miles in circumference, and had just been entirely enclosed with brick, when I paid my first visit. The house was built by the first Earl of Leicester and wife about 1734, and they dying without children, it descended to Mr. Coke the nephew, as the next of kin. He was then quite young. It remained totally neglected until he took possession of it on reaching his majority, with no means however to cultivate, or improve it. He was advised to pull down the house, sell the bricks, and dispose of the lands at any price or abandon them. It was about this period that, speaking of the poverty of Holkham, one of the females of the Walpole family wittily said of it, "that there was always two rabbits contending for one blade of grass." Its character and poverty however admit of no doubt, for over the door of the entrance hall is the following remarkable inscription in marble.

"This Seat, On An Open Barren Estate
Was Planned, Planted, Built, Decorated,
And Inhabited, The Middle Of The 18th Century,
By Thomas Coke, Earl Of Leicester."

On taking possession of the estate the first effort was to sell. He offered it at 2s. 6d. an acre, but being unable to get even that, he determined to borrow the necessary funds, and reclaim it. He did so, removed to it in his twenty-second year and devoted himself to it for life. Amid the prejudices, ignorance and apathy of the people of Norfolk, he continued firm and resolute, and kept to his opinions and persevered for years with all his characteristic energy of purpose. Then it was that things began to change. Men of talent and enterprise began to take up the matter. The people were awakened out of the sleep which precedes dissolution, to consider and reflect on the subject, and their duties; and in less than a quarter of a century, his patriotism and industry triumphed over ignorance and apathy, and a poor barren estate that could neither be sold nor cultivated, in its then state, was made a perfect garden spot, yielding an income of 40 shillings or more an acre, and producing average crops in later years of forty to fifty bushels of wheat and more to an acre. It was during one of my visits, that he told me that he had lived to see all his expectations more than realized and justified; and that one of the most gratifying things, connected with his agricultural life was, that only a few months before, he had embarked with his wife and four sons on board of a vessel which was launched at Wells, a small town near Holkham, which had been built out of *Oak produced from acorns* of his own planting! He was then I suppose more than eighty, and of course the oak was some sixty years old! I will not suffer myself to speak of the extent and vastness of the estate, created as it were by one man alone and unassisted. To give you, however, from certain data, an idea of the extent and character of the cropping, I will read an extract from a Treatise on Practical Farming and Grazing, by C. Hilliard, Esq., a distinguished agriculturalist, published in 1837, and a copy of which he was good enough to present to me. In page 32 he says:

"At Holkham the wheat, being short in the straw, is mowed with a cradle scythe: youths, women and boys, immediately following the mowers, binding it up (assisted by horse-rakes) into sheaves, which, as the straw is free from weeds, if the weather is particularly fine, they will carry without setting the sheaves up in the usual manner in shocks. I was at Holkham, about eight days, in the year 1831, at the time wheat was harvesting, and a most animating sight it was. I counted above one hundred, men, women, and boys, employed in one large field. In this way, *three hundred and forty-five acres* of wheat were cut, carted and stacked, in six days. This was getting on with wheat harvest more expeditiously, perhaps, than is in the power of any other person in the kingdom. I saw at the same time, *four hundred and fifty acres* of turnips, of different sorts, and mangel wurzel, in which Mr. Coke challenged me to find a single weed, excepting some that might have just

sprung up out of the ground. I could not see one weed that was three or four inches long, and this was clean farming on a large scale as probably could not be seen in any part of the world."

Now I call upon our anti-scientifics and of the "Good Enoughs," to explain how these results could have been produced under any circumstances, upon such an estate as this was, without the aid *of the most high and finished system of scientific cultivation!* One field of three hundred and forty-five acres producing between fourteen and fifteen thousand bushels of wheat, and four hundred and fifty acres more in luxuriant "turnips!" Why gentlemen, it must strike the imaginations of these friends of ours as more like the enchantments of fable and story than sober reality. But why speak of him as the most remarkable agriculturalist that ever lived! It is matter of history and not to be questioned! Will you pardon me, in referring to what one of the distinguished writers of the day says of him and his farming:

"The country and not alone the country, but the world, it may truly be said, acknowledges the benefits of Mr. Coke's exertions in the advancement of the first of Arts. For himself, both as regards his happiness and his after reports to posterity, nothing could have been more full of congratulation than his early selection of such a study. To prosecute with such advantage any pursuit to such a period; to enjoy so long a duration of uninterrupted health; to see the patrimony of his ancestors improved beyond all possible computation; to know that from his example, his spirit, his skill, and his encouragement, not alone his own estate, not the country where he lived, not the country itself only, but every civilized nation on the face of the globe, may be said to owe some portion of obligation to his labors; to be able to assemble the curious, the scientific, and the eminent, in vast numbers around him; to hear his just praises spoken from the lips not only of men distinguished in arts, in arms, and in letters, but of princes of his own and foreign lands. All these together form an aggregate of fortune that attends but a very few among those who are born and die. Yet such is the consummation (and a proud spectacle it is both for the individual and for his country) that Holkham has existed—and that, under Divine Providence, Mr. Coke has been made the instrument of diffusing so many and such great blessings among mankind."

And well may England place among her first men, and her most beneficent benefactors, the man who shed such a lustre upon her agriculture, and that of the world. He did for the agriculture of England, what *John Hampden* did for the liberties of Englishmen against tyranny. And if the reward of popular praise, and popular honours, are due to those who, guided by a wise philosophy, and whose objects have been the welfare and improvement of mankind, then are they due to Thomas William Coke.

Strawberry Runners.

I BEG to give my opinion in favour of cutting the runners off strawberry plants. Being a lover of this fruit, and therefore anxious to procure information upon its cultivation, my attention was arrested by an able leading article in the *Chronicle* some years ago, against mowing off the foliage of the strawberry at the fall of the year, as also against other abuses which had crept into its cultivation. The directions given in this article I implicitly obeyed, and have every reason to be grateful for the knowledge which it imparted. But the cutting off the runners being a subject upon which that article did not enter, I was induced to experiment upon it myself. For this purpose I made a new plantation, in which the plants were placed eighteen inches apart in rows, and the rows themselves two feet asunder. I have never allowed a runner to exceed half a foot in length upon any of these, and the consequence has been that the plants have become strong and bushy. The crop this season has been abundant and the fruit individually large in size. While my neighbours' plants during winter seemed to be creeping back whence they came, not being able to bear the withering and biting blast of the season, mine stood up full of freshness and vigour, aud ready to start into growth at the first approach of spring. So convinced am I of the propriety of cultivating this fruit in separate and distinct plants, and of cutting off the runners, that I have this season taken out a plant between each of my plantations, thus making the distance between each plant four feet by three. From these I am cutting off the runners with the greatest care. But why huddle up strawberry plants together and cultivate other fruits separately and distinctly? Does not this plant, as others, exclaim, in language not to be mistaken, "Give me air or I shall die?"—*Gardener's Chronicle.*

MAHOGANY is becoming so cheap in England that ship builders are using it instead of teak wood. The reduction in price is caused by the extensive use of other woods, as black walnut, oak, &c., in the manufacture of cabinet ware.

For the Farmers' Cabinet.

Animal Poisons—their Cure.

Mr. Editor,—The lamented death of Dr. Wainwright, from the bite of a rattlesnake, induces me to send you a communication I wrote some months since, on the subject mentioned in the title of this article.

About two years ago, you published an article in which it is stated that a professor of a Southern college—if I recollect right—discovered that aqua ammonia or spirits of hartshorn, was an excellent remedy for the bites of musquitoes, and that he had used it very successfully for the stings of other insects. A few more hints and recommendations upon that subject, would, perhaps, be acceptable.

It would seem that all animal poisons are of an *acid* nature, for I find by numerous experiments, that the application of *alkaline* substances to them, has the effect of destroying their power. This I suppose they do by neutralizing them. I find that our common washing soda, pulverized very fine, and laid on the spot where the sting of the insect has inserted the poison, and a drop of water added so as to dissolve it, will, in a few moments entirely allay the pain, however severe it may have been before the application. And another desirable result follows—there is but little or no swelling afterwards. The soda seems to penetrate into the wound, and entering into chemical combination with the poison, renders it harmless. The reason why ammonia does this, is because it is an alkali—and all the alkalies have a like effect. Soda, fresh burnt lime, potash, and ammonia, are the alkalies most easily obtained.

Salts, such as common table salt, epsom salts, glauber salts, sal æratus, &c., have a very good effect when applied in the same manner, but not so good as the alkalies, as it is the alkaline principle of the salt that operates, and the power of the alkaline principle to do good is lessened by the other constituents of the salt.

I am told that a mixture of brandy and common salt is much used on the prairies, and in the woods in the West, by the hunters and trappers, as an antidote to the bite of rattlesnakes, rabid wolves, and rabid Indian dogs, and I have no doubt that the soda of the salt is mainly instrumental in producing the good effect. I have but little doubt that if weak ley of potash, or soda, were administered by injection, and given to the stomach in a powdered form, to those afflicted with hydrophobia, they would soon get rid of their awful feelings. And I am strongly disposed to think, that the same treatment would be highly beneficial to those who are suffering from the effects of a bite of a rattlesnake.

I make it a practice in the summer to carry with me whenever I go into the woods, or where I am liable to meet with rattlesnakes or poisonous insects, to take a small bottle filled with water, in which is dissolved as much of the common washing soda as the water will dissolve, and I frequently have occasion to use it for the bites and stings of insects, and with uniform good success. If I were bitten by a rattlesnake, I should immediately apply it to the wound, as it cannot do harm, and I am disposed to think, would be of the most essential service.

I recommend to others, most heartily, the course I thus pursue. Chemico.

Lewisburg, Pa., Feb. 3rd, 1848.

Importance of Phosphates.

My Dear Sir,—My recent researches into the constituent ingredients of our cultivated fields, have led me to the conclusion that, of all the elements furnished to plants by the soil, and ministering to their nourishment, the phosphate of lime, or, rather the phosphates generally, must be regarded as the most important.

In order to furnish you with a clear idea of the importance of the phosphates, it may be sufficient to remind you of the fact, that the blood of man and animals, besides common salt, always contains alkaline and earthy phosphates. If we burn blood, and examine the ashes which remain, we find certain parts of them soluble in water, and others insoluble. The soluble parts are, common salt and alkaline phosphates; the insoluble consist of phosphate of lime, phosphate of magnesia, and oxide of iron.

These mineral ingredients of the blood—without the presence of which in the food, the formation of blood is impossible—both man and animals derive, either immediately or mediately, through other animals, from vegetable substances used as food; they had been constituents of vegetables, they had been parts of the soil upon which the vegetable substances were developed.

If we compare the amount of phosphates in different vegetable substances with each other, we discover a great variety, while there is scarcely any ashes of plants altogether devoid of them, and those parts of plants which experience has taught us are the most nutritious, contain the largest proportion. To these belong all seeds and grain, especially the varieties of bread-corn, peas, beans, and lentils.

It is a most curious fact that, if we incinerate grain, or its flour, peas, beans, and

lentils, we obtain ashes which are distinguished from the ashes of all other parts of vegetables by the absence of *alkaline carbonates.* The ashes of these seeds, when recently prepared, do not effervesce with acids; their soluble ingredients consist solely of alkaline phosphates, the insoluble parts of phosphate of lime, phosphate of magnesia, and oxide of iron; consequently of the very same salts which are contained in blood, and which are absolutely indispensable to its formation. We are thus brought to the further indisputable conclusion, that no seeds suitable to become food for man and animals, can be formed in any plant without the presence and co-operation of the phosphates. A field in which phosphate of lime or the alkaline phosphates form no part of the soil, is totally incapable of producing grain, peas, or beans.

An enormous quantity of these substances indispensable to the nourishment of plants, is annually withdrawn from the soil and carried into great towns, in the shape of flour, cattle, et cetera. It is certain that this incessant removal of the phosphates must tend to exhaust the land and diminish its capability of producing grain. The fields of Great Britain are in a state of progressive exhaustion from this cause, as is proved by the rapid extension of the cultivation of turnips and mangel wurzel—plants which contain the least amount of the phosphates, and therefore require the smallest quantity for their developement. These roots contain 80 to 92 per cent. of water. Their great bulk makes the amount of produce fallacious, as respects their adaptation to the food of animals, inasmuch as their contents of the ingredients of the blood; that is, of substances which can be transformed into flesh—stands in a direct ratio to their amount of phosphates, without which neither blood nor flesh can be formed.

Our fields will become more and more deficient in these essential ingredients of food, in all localities where custom and habits do not admit the collection of the fluid and solid excrements of man, and their application to the purposes of agriculture. In a former letter I showed you how great a waste of phosphates is unavoidable in England, and referred to the well known fact, that the importation of bones restored in a most admirable manner, the fertility of the fields exhausted from this cause. In the year 1827, the importation of bones for manure amounted to forty thousand tons, and Huskisson estimated their value to be from one hundred thousand to two hundred thousand pounds sterling. The importation is still greater at present, but it is far from being sufficient to supply the waste.

Another proof of the efficacy of the phosphates in restoring fertility to exhausted land, is afforded by the use of the *guano*—a manure which, although of recent introduction into England, has found such general and extensive application.

We believe that the importation of one hundred weight of *guano*, is equivalent to the importation of eight hundred weight of wheat—the hundred weight of guano assumes, in a time which can be accurately estimated, the form of a quantity of food corresponding to eight hundred weight of wheat. The same estimate is applicable in the valuation of bones.

If it were possible to restore to the soil of England and Scotland the phosphates which during the last fifty years have been carried to the sea by the Thames and the Clyde, it would be equivalent to manuring with millions of hundred weights of bones, and the produce of the land would increase one-third, or perhaps double itself, in five to ten years.

We cannot doubt that the same result would follow, if the price of the guano admitted the application of a quantity to the surface of the fields, containing as much of the phosphates as have been withdrawn from them in the same period.

If a rich and cheap source of phosphate of lime and the alkaline phosphates were open to England, there can be no question that the importation of foreign corn might be altogether dispensed with after a short time. For these materials England is at present dependent upon foreign countries, and the high price of guano and of bones prevents their general application, and in sufficient quantity. Every year the trade in these substances must decrease, or their price will rise as the demand for them increases.

According to these premises, it cannot be disputed, that the annual expense of Great Britain for the importation of bones and guano is equivalent to a duty on corn—with this difference only, that the amount is paid to foreigners in money.

To restore the disturbed equilibrium of constitution of the soil—to fertilize her fields—England requires an enormous supply of animal excrements; and it must, therefore, excite considerable interest to learn that she possesses, beneath her soil, beds of fossil *guano*, strata of animal excrements, in a state which will probably allow of their being employed as a manure at a very small expense.

The coprolites discovered by Dr. Buckland—a discovery of the highest interest to geology—are these excrements; and it seems

extremely probable that in these strata England possesses the means of supplying the place of recent bones, and therefore the principal conditions of improving agriculture—of restoring and exalting the fertility of her fields.

In the autumn of 1842, Dr. Buckland pointed out to me a bed of coprolites in the neighbourhood of Clifton, from half to one foot thick, enclosed in a limestone formation, extending as a brown stripe in the rocks, for miles along the banks of the Severn. The limestone marl of Lyme Regis consists, for the most part, of one-fourth part of fossil excrements and bones. The same are abundant in the lias of Bath, Eastern, and Broadway Hill, near Eversham. Dr. Buckland mentions beds, several miles in extent, the substance of which consists, in many places, of a fourth part of coprolites.

Pieces of the limestone rock of Clifton, near Bristol, which is rich in coprolites and organic remains, fragments of bones, teeth, &c., were subjected to analysis, and were found to contain above 18 per cent. of phosphate of lime. If this limestone is burned, and brought in that state to the fields, it must be a perfect substitute for bones, the efficacy of which as a manure does not depend, as has been generally but erroneously supposed, upon the nitrogenized matter which they contain, but on their phosphate of lime.

The osseous breccia found in many parts of England deserves especial attention, as it is highly probable that in a short time it will become an important article of commerce.

What a curious and interesting subject for contemplation! In the remains of an extinct *animal* world, England is to find the means of increasing her wealth in agricultural produce, as she has already found the great support of her manufacturing industry in fossil fuel—the preserved matter of primeval forests—the remains of a *vegetable* world. May this expectation be realized! and may her excellent population be thus redeemed from poverty and misery!—*Liebig's Letters.*

Horticultural Premiums.

The Pennsylvania Horticultural Society will hold its stated meeting in the Museum building on the 21st of next month, at 7½ o'clock, P. M. The following premiums are offered.

Rhododendron.—For the best specimen, to be exhibited in a pot, $3.

For the second best do. do. do. $2.

For the best American Seedling, do. $3.

Azaleas.—For the best, three named varieties to be exhibited in pots, $3.

For the second best do. do. do. do. $2.

For the third best do. do. do. do. $1.

For the best American Seedling, to be exhibited in a pot, $3.

Pears.—For the best, six to be exhibited, $2.

For the second best do. do. $1.

Apples.—For the best, five named varieties, three specimens of each, $2.

For the second best do. do. do. do. $1.

From the Cultivator.

Iowa as an Agricultural State.

Eds. Cultivator,—I consider Iowa as first in point of natural advantages of any state in the Union for Agricultural purposes. Our prairie soil is a black vegetable mould, from one and a-half to three feet deep. The subsoil is a stiff clay. The prairies are not generally over two to three miles in width, and the timber is good. There is, probably, about an equal proportion of prairie and timber.

We seldom or never have a failure in our corn crop, and vegetables of all kinds grow to an enormous size with little cultivation. Iowa is one of the best watered states in the Union for hydraulic purposes. Wheat some seasons is very abundant, but is frequently winter-killed. I trust we shall find by close and practical observation, a remedy for this evil before many years. Corn being our staple production, it would naturally lead us to be a great pork-making people—and were we nearer the ultimate market for this great staple, or had we a direct railroad communication to the Atlantic states, in five years we would be second to no state in the production of pork.

We have made more fresh pork this season in Iowa, than our capitalists are able to purchase, and the difficulty of getting it to market, as well as the want of knowledge in regard to the number of hogs to be slaughtered in our state, has prevented eastern capital from finding its way here.

Consequently, the price is very low, and a majority of the farmers are packing their own pork. This should never be the case. Farmers can never put up their pork and send it to market as advantageously as men accustomed to that business. They should, and generally would be willing to sell at a fair price, rather than have the trouble of packing and shipping for themselves.

I am astonished that more capital is not invested in our state in the growing of wool; from the experience of all who have engaged in it, to any considerable extent, it has

proved the adaptation of our soil and climate to this important branch of husbandry—and is found as lucrative as any other branch of agriculture. I am informed by a pretty extensive wool grower in my neighbourhood from Washington county, Pa., that his sheep are not subject to many of the diseases here, that they were in Pa.

I do not think it probable that the eastern wool grower upon land worth $50 to $100 per acre, and hay worth $15 per ton, could successfully compete with the western, where land is worth $5 per acre, and hay $2.50 per ton.

We are only in the first year of our existence as a state, and the fourteenth as the inhabitant of a white man—still our population numbers between 150 and 200,000 inhabitants, a greater portion of them from the New England and middle states; they are probably as well informed, and as industrious as the same number in any of our sister states; and all that we want to make us prosperous and happy, is the communication before spoken of with the east.

The health of Iowa, off the water courses, is as good as in any other state. On the water courses, we, like all the west, are subject to fever and ague.

The ease with which we cultivate our prairie farms, would astonish our New England farmers. They would hardly believe that one man with a pair of horses, could cultivate forty-five acres of land in corn, and do it well; but this is not an uncommon occurrence.

We can raise 500 bushels of potatoes to the acre with no other work than to plough them twice or thrice, with the shovel plough after they are planted, that is, without the use of manure or hoe.

The shovel plough is the only tool used in the after culture of corn, and an average crop is from forty to sixty bushels per acre; besides, our corn fields are generally so well lined with pumpkins in the fall, that a man can walk on them all over his corn field.

I may add that I raised the last season 150 bushels of potatoes from two bushels, planted in one corner of my corn field, without manure or the use of the hoe.—J. A. Pinto. *Hartford, Iowa, Dec.* 13, 1847.

Soiling.

By R. L. Pell, Pelham Farm, Ulster county.

For the last four years it has been my constant practice to soil, not only cows, but hogs, oxen, and horses. My yards are large, enclosed by stone walls, and so arranged as to collect all the manure in the centre. There is a pump and trough convenient to it, and open sheds where the animals may lie and ruminate at pleasure. Three times each day, at stated hours, green crops are cut and brought to them, such as clover and timothy grass, green oats, green corn stalks, green buckwheat in bloom, root tops, &c. Occasionally, by way of change, dry hay and straw are cut up and given to them, mixed with sufficient wheat bran to induce them to relish it. The stock are never permitted to waste anything; that left by the cows is given to the horses, as horses will eat after cows, and vice versa, cows after horses; but they will not eat after each other. The leavings of the horses is then fed to the hogs. The animals are enabled to consume their quantum in about thirty minutes, when they immediately lie down, rest, take on fat, and secrete milk. If pastured, they require many hours to obtain the requisite food, besides laboring diligently, which has a tendency to prevent the secretions, either of fat or milk. They have but little time to ruminate; and when driven to and from pasture, run wildly about the field; are whipped, stoned, and chased by dogs, which causes them to become feverish, and as a result, contract their milk vessels.

Salt should always be within reach of the animals in the yard, as it is indispensable to keep the organs of digestion active, increase the milk and growth of fat; and it much improves the quality of the flesh.

I have found, by actual experiment, that cows, when fed in the yard at regular periods, with a change of food, not allowing them at any time to be overfed, and supplied at all times with an abundance of water, have doubled their milk; that is to say, the same cows that were one year depastured gave, when confined, twice the quantity of milk, and of a much richer quality. When depastured, I did not obtain a particle of manure; it was dropped upon the soil, certainly, but with very little advantage to it; nearly all the volatile gases were immediately given to the atmosphere, and many of its other valuable properties were withdrawn from it by flies; so that the soil received but little benefit. One of the principal and most valuable ingredients in manure is ammonia, which is converted to a volatile substance in farm-yard manure, called nitrogen, and is, of all others, the fertilizer that must, if possible, be saved, as neither seeds nor plants can be produced without it. The manure dropped in the field is deprived immediately of this indispensable gas. The potash and soda also being easily dissolved by water, are likewise practically lost, by being deposited in excess. In the barnyard these valuable substances may be preserved by means

of charcoal dust, which absorbs the ammonia as it rises to escape, and the potash as it dissolves, by absorption, and holds them until saturated with rain, when the gases are again disseminated in the heap, and the charcoal takes in moisture. This manure may then be placed on fields in large or small quantities, as required, and in such a manner as to produce the most advantage. An opportunity is afforded likewise, of making any description of manure needed. If highly nitrogenized substances are required for crops, allow the hogs to run in the barn-yard, and feed them corn; it contains valuable nutritious elements, suitable not only to the growth of plants, but the animals themselves, being composed of nitrogen, potash, carbon, soda, lime, and other necessary chemicals, all of which, after having formed the bones, flesh, fat, skin, hair and muscles of the animal, are finally returned to the manure heap in lesser quantities. The value of the manure may be farther increased by feeding oats, rye, peas, buckwheat, cut straw, &c.

One reason that the excrement of the horse is so much richer and more valuable than that of the cow is, that the horse is fed on farinaceous matter, corn, oats, &c., which the cow is not; and so likewise is that of man, because he partakes of a great variety of food, both animal and vegetable. My barnyard has yielded me a large amount of manure per annum, since I commenced soiling my stock; whereas, before, I did not obtain a single load, except in winter. The plan I adopt is, to cast daily all the refuse of the farm into the yard; such as weeds, muck, leaves, refuse straw, sods from the hedge rows, pond mud, refuse vegetables, and numerous other substances that might be named; the hogs turn them over and incorporate them one with another, and the stock tramples down and forms them into a solid mass; charcoal dust is once a week spread over the whole, which retains and preserves all the gases that would otherwise escape; every three months it is drawn out, placed in a square heap, and mixed with plaster, ashes, salt, muck, and guano; the whole is then covered with charcoal dust to the depth of six inches, and left until fall, when it is used upon the fields most requiring it; spread on broad cast, and ploughed under the earth, and the crops make use of the gases as nature provides, and all care ceases.

Another most important advantage accrues to the soiler, viz: a piece of land that would support five cows, depastured one week, would amply furnish the same with an abundant supply of food one month, if cut and carried to them. The piece depastured would likewise be almost destroyed by poaching in wet weather, trampling, sleeping upon, and injury to the herbage by close eating. Horses do much more damage than cows, as they eat much closer, and frequently pull the grass out by the roots.

When cattle are stall-fed, or soiled in the the yard, the nitrogen of the manure may be preserved by artificial means. It is an ingredient absolutely indispensable to the growth of plants. By analysis it has been found in every part of the growing plant; the roots, stems, leaves, &c., contain it, showing that without it plants cannot be grown. How important then is it, that so valuable a substance should be preserved. I have grown plants in pure charcoal dust, by watering them with rain water; the rain water yielded them ammonia, and consequently nitrogen as one of its elements. I found with spring water, I could not grow them after a certain period at all in charcoal dust; but with rain water most successfully. Although the air must contain a vast quantity of nitrogen, I am confident the plants I grew, did not obtain the quantity they required from that source; if they had, the spring water would have answered them as well as rain water; they must have obtained it through the medium of ammonia contained in the rain water. This is a singular fact, and goes to show that although a generation of more than one thousand millions of the children of Adam, and 20,000 millions of animals cease to exist, aud the nitrogen which they contain, is yielded in part to the air air of heaven every thirty years, still plants cannot elaborate it in their system, except through the medium of their roots. The hydrogen unites with the nitrogen, afforded, not only by dead animals, but by the excrement and urine of all animals while living, as well as other putrescent matter; thus forming ammonia, which combines with carbonic acid gas, and descends with every shower to the earth's surface, in a soluble form, easily taken up by the roots, and distributed throughout the plant. Davy calculates, that if a pint of rain water contain only a quarter of a grain of ammonia, a field of forty thousand square feet must receive yearly upwards of eighty pounds of ammonia, or sixty-five pounds of nitrogen; for it is ascertained that the annual fall of rain water in England, on this extent of surface, is at least 2,500,000 pounds. This is much more nitrogen than is contained in the form of vegetable albumen and gluten in 2,800 lbs. of hay, or 20,000 lbs. of beet root, which would be the yearly produce of such a field; but it is less than the straw, roots, and grain of corn, which might grow on the same sur-

face, would contain; therefore, the farmer must supply the deficiency of nitrogen by using manures containing ammonia.

Animal manure is chiefly valuable for the ammonia which it produces. Without it, fodder for animals, or vegetables and grain for man, cannot be grown. Manure without stint with nitrogenized substances, and the wheat grown will yield 18 per cent. of gluten, will weigh 64 lbs., and produce 50 bushels to the acre. Such has been the result of an experiment I tried upon a wheat field, when the adjoining field, treated in the usual manner, yielded me wheat weighing 56 pounds, and 15 bushels to the acre, and probably not more than five per cent. of gluten. I placed some of the same nitrogenized composition upon a barren piece of sandy land, which I had never seen covered with verdure of any description, and in a very short period of time, it was clothed with a dense dark green grass, which tillered well. White clover afterwards came in, (which, when it dies, affords food for a succession of plants) and the piece may be considered as reclaimed.—*N. Y. Agricultural Transactions.*

Food of the Horse.

The system of manger-feeding is becoming general among farmers. There are few horses that do not habitually waste a portion of their hay; and by some the greater part is pulled down and trampled under foot, in order first to cull the sweetest and best locks, and which could not be done while the hay was enclosed in a rack. A good feeder will afterwards pick up much of that which was thrown down; but some of it must be soiled and rendered disgusting, and, in many cases, one-third of this division of the food is wasted. Some of the oats and beans are imperfectly chewed by all horses, and scarcely at all by hungry and greedy ones. The appearance of the dung will sufficiently evince this.

The observation of this induced the adoption of manger-feeding, or of mixing a portion of chaff with the corn and beans. By this means the animal is compelled to chew his food; he cannot, to any great degree, waste the straw or hay; the chaff is too hard and too sharp to be swallowed without considerable mastication, and, while he is forced to grind that down, the oats and beans are ground with it, and yield more nourishment; the stomach is more slowly filled, and therefore acts better on its contents, and is not so likely to be overloaded; and the increased quantity of saliva thrown out in the lengthened maceration of the food, softens it, and makes it more fit for digestion.

Professor Stewart very properly remarks that "many horses swallow their corn in great haste, and when much is eaten, that habit is exceedingly dangerous. The stomach is filled—it is overloaded before it has time to make preparation for acting on its contents—the food ferments, and painful or dangerous colic ensues. By adding chaff to his corn, the horse must take more time to eat it, and time is given for the commencement of digestion, before fermentation can occur. In this way chaff is very useful, especially after long fasts."

If, when considerable provender was wasted, the horse maintained his condition, and was able to do his work, it was evident that much might be saved to the farmer, when he adopted a system by which the horse ate all that was set before him; and by degrees it was found out that, even food somewhat less nutritious, but a great deal cheaper, and which the horse either would not eat, or would not properly grind down in its natural state, might be added, while the animal would be in quite as good plight, and always ready for work.

Chaff may be composed of equal quantities of clover or meadow hay, and wheaten, oaten, or barley straw, cut into pieces of a quarter or half an inch in length, and mingled well together; the allowance of oats or beans is afterwards added, and mixed with the chaff. Many farmers very properly bruise the oats or beans. The whole oat is apt to slip out of the chaff and be lost; but when it is bruised, and especially if the chaff is a littled wetted, it will not readily separate; or, should a portion of it escape the grinders, it will be partly prepared for digestion by the act of bruising. The prejudice against bruising the oats is, so far as the farmer's horse, and the wagon horse, and every horse of slow draught, are concerned, altogether unfounded. The quantity of straw in the chaff will always counteract any supposed purgative quality in the bruised oats. Horses of quicker draught, except they are naturally disposed to scour, will thrive better with bruised than with whole oats; for a greater quantity of nutriment will be extracted from the food, and it will always be easy to apportion the quantity of straw or beans to the effect of the mixture on the bowels of the horse. The principal alteration that should be made in the horse of harder and more rapid work, such as the post-horse, and the stage-coach horse, is to increase the quantity of hay, and diminish that of straw. Two trusses of hay may be cut with one of straw.

Some gentlemen, in defiance of the prejudice and opposition of the coachman or the groom, have introduced this mode of feeding into the stables of their carriage-horses and

hackneys, and with manifest advantage. There has been no loss of condition or power, and considerable saving of provender. This system is not, however, calculated for the hunter or the race-horse. Their food must lie in smaller bulk, in order that the action of the lungs may not be impeded by the distension of the stomach; yet many hunters have gone well over the field who have been manger-fed, the proportion of corn, however, being materially increased.

For the agricultural cart-horse, eight pounds of oats and two of beans should be added to every twenty pounds of chaff. Thirty-four or thirty-six pounds of the mixture will be sufficient for any moderate-sized horse, with fair, or even hard work. The dray and wagon horse may require forty pounds. Hay in the rack at night is, in this case, supposed to be omitted altogether. The rack, however, may remain, as occasionally useful for the sick horse, or to contain tares or other green meat.

Horses are very fond of this provender. The majority of them, after having been accustomed to it, will leave the best oats given to them alone, for the sake of the mingled chaff and corn. We would, however, caution the farmer not to set apart too much damaged hay for the manufacture of the chaff. The horse may be thus induced to eat that which he would otherwise refuse; but if the nourishing property of the hay has been impaired, or it has acquired an injurious principle, the animal will either lose condition, or become diseased. Much more injury is done by eating damaged hay or musty oats, than is generally imagined. There will be sufficient saving in the diminished cost of the provender by the introduction of the straw, and the improved condition of the horse, without poisoning him with the refuse of the farm. For old horses, and for those with defective teeth, chaff is peculiarly useful, and for them the grain should be broken down as well as the fodder.

While the mixture of chaff with the corn prevents it from being too rapidly devoured and a portion of it swallowed whole, and therefore the stomach is not too loaded with that on which, as containing the most nutriment, its chief digestive power should be exerted, yet, on the whole, a great deal of time is gained by this mode of feeding, and more is left for rest. When a horse comes in wearied at the close of the day, it occupies, after he has eaten his corn, two or three hours to clear his rack. On the system of manger-feeding, the chaff being already cut into small pieces, and the beans and oats bruised, he is able fully to satisfy his appetite in an hour and a half. Two additional hours are therefore devoted to rest. This is a circumstance deserving of much consideration, even in the farmer's stable, and of immense consequence to the post-master, the stage-coach proprietor, and the owner of every hard worked horse.

Manger food will be the usual support of the farmer's horse during the winter, and while at constant or occasional hard work; but from the middle of April to the end of July, he may be fed with this mixture in the day and turned out at night, or he may remain out during every rest day, A team in constant employ should not, however, be suffered to be out at night after the end of July.

The farmer should take care that the pasture is thick and good; and that the distance from the yard is not too great, or the fields too large, otherwise a very considerable portion of time will be occupied in catching the horses in the morning. He will likewise have to take into consideration the sale he would have for his hay, and the necessity for sweet and untrodden pasture for his cattle. On the whole, however, turning out in this way, when circumstances will admit of it, will be found to be more beneficial for the horse, and cheaper than soiling in the yard.

The horse of the inferior farmer is sometimes fed on hay or grass alone, and the animal, although he rarely gets a feed of corn, maintains himself in tolerable condition, and does the work that is required of him: but hay and grass alone, however good in quality, or in whatever quantity allowed, will not support a horse under hard work. Other substances containing a larger proportion of nutriment in a smaller compass, have been added. They shall be briefly enumerated, and an estimate formed of their comparative value.

In almost every part of Great Britain, Oats have been selected as that portion of the food which is to afford the principal nourishment. They contain seven hundred and forty-three parts out of a thousand of nutritive matter. They should be about or somewhat less than a year old, heavy, dry, and sweet. New oats will weigh ten or fifteen per cent. more than old ones; but the difference consists principally in watery matter, which is gradually evaporated. New oats are not so readily ground down by the teeth as old ones. They form a more glutinous mass, difficult to digest, and, when eaten in considerable quantities, are apt to occasion colic and even staggers. If they are to be used before they are from three to five months old, they would be materially improved by a little kiln-drying. There is no fear for the horses from simple drying, if the corn was good when it was put into the kiln. The old oat forms, when chewed, a smooth and uniform

mass, which readily dissolves in the stomach, and yields the nourshment which it contains. Perhaps some chemical change may have been slowly effected in the old oat, disposing it to be more readily assimilated. Oats should be plump, bright in colour, and free from unpleasant smell or taste. The musty smell of wetted or damaged corn is produced by a fungus which grows upon the seed, and which has an injurious effect on the urinary organs, and often on the intestines, producing profuse staling, inflammation of the kidneys, colic, and inflammation of the bowels. —*Youatt on the Horse.*

Drink and Shade for Stock.

One essential requisite in all pasture-fields is an abundant supply of *water* for stock to drink. Both cattle and horses drink largely, and sheep grazing early on the dewy grass, do not require so much water to keep them in a healthy condition; still, when there is no dew, they do drink water. The proper construction of a watering-pool is sadly misunderstood in this country. The entrance to it generally consists of poached mud of at least half a foot in depth, and to avoid this, the animals go into the water before they drink, when, of course, it is at once rendered muddy. Not unfrequently there is scarcity of water, and if there is just sufficient supply to prevent the pool being evaporated to dryness, the water is rendered almost stagnant. So obvious are the objections to this mode of administering so necessary and wholesome a beverage to the brute creation as water, that all that seems necessary to an amendment of the system is to point out its inconveniences. True, in some cases, tanks of wood or stone are provided in fields, which are supplied from some adjoining spring, or even pump-well, and as far as the quality of the water is concerned, this is a much better mode of supplying it than in pools; but this mode, good as it is as far as it goes, does not provide all the requisites of a good watering-pool. In hot days, a walk through a pool is very wholesome to the feet of cattle, and in dry weather, a stand for some time among water is an excellent preventive of that troublesome complaint, the foot-sore. The external application of water in this manner allays inflammation, and prevents irritation, and permits animals to take their food in peace even in scorching drought. Besides the tank of a pump-well is not unfrequently neglected to be filled—because in cold and rainy weather it is scarcely visited by the cattle, in hot weather it is supposed to be viewed with the same indifference; and, even where tanks are duly attended to for cattle, there are none set down at a lower level for sheep. A watering-pool should be securely fenced, as cattle are very apt to push one another about while in it, and for that reason it should also be roomy. It should be of considerable length and narrow, to allow access to a number of animals at the same time, if they choose to avail themselves of it; and I have often observed cattle delight to go to the water in company. Pools are usually made too small and too confined. The access to them should be made firm with broken stones in lieu of earth, and gravel placed on its bottom keeps the water clean and sweet, while the water should flow gently through the pool.

The want of *shade* in pasture-fields is also a sad reflection on our farmers. Observe, in summer, where the shade of a tree casts itself over the grass, how gratefully cattle resort to it, and where a spreading tree grows in a pasture-field, its stem is sure to be surrounded by cattle. The stirring breeze under such a tree is highly grateful to these creatures; and such a place affords them an excellent refuge from the attacks of flies. In cold weather, also, observe how much shelter is afforded to cattle by a single tree, and how they will crowd to the most wooded corner of a field in a rainy day, even in summer. Ought not such indications of animals teach us to afford them the treatment most congenial to their feelings? I am no advocate for hedge-row trees, even though they should cast a grateful shade into a pasture-field, and still less do I admire an umbrageous plane in the middle of a field that is occupied in course with a crop of grain or turnips; but similar effects as good as theirs may be obtained from different agencies. A shed erected at a suitable part in the line of the fence of a field, would not only afford shade in the brightest day in summer, but comfortable shelter in a rainy day, or in a cold night in autumn. Such an erection would cost little where stone and wood are plenty on an estate, and they could be erected in places to answer the purpose of a field on either side of the fence when it was in grass. But no matter what it may cost, when the health and comfort of stock are to be maintained unimpaired by its means. The cost of a shed may, perhaps, in this way be repaid in the first year of its existence, and it would stand, with slight occasional repairs, during the currency of a long lease. When such an erection is properly constructed at first, it is surprising how many years it will continue to be useful with a little care. Let it be roomy, and its structure light, as it may be roofed at a moderate cost with zinc, or composition of some sort,

or tiles, when they are manufactured in the neighbourhood. It may be troublesome to carry straw for litter from the steading to a shed situate at a distance, but there is no occasion for straw for litter in summer; the rough grass from an adjoining plantation or ditch will supply litter, and the dung at any rate should be shovelled up and carried away before it becomes uncomfortable to the animals. I should like to see a farm with such a shed erected in it for every two fields.—*Stephens' Book of the Farm.*

A Hint to Farmers.—Some time about the middle of the last century, a landed proprietor in one of the midland counties, resolved to keep his property in his own possession. A little time convinced him, as it has frequently done others, that a landlord is his own worst tenant. He, therefore, let one-half of his estate to a person who was punctual in paying his stipulated rent. About ten years after this arrangement, he found difficulties increasing, so that he was forced to raise money, and having great confidence in his tenant, he consulted him upon the best manner in which it could be done. "Why, by selling that part of your estate which I possess, and reserving that which you still occupy." "Yes, but money is scarce; where am I to find a purchaser?" "Myself." "You, who came in straitened circumstances to occupy at a high rent only half of the property upon which I, the proprietor of the whole, was nearly beggared by farming! How are you enabled to purchase a moiety of my estate?" "Simply because you, lying in bed, said to your servants, *Go!* do so and so; while I, rising before mine, said, *Come!* do so and so. All my prosperity rests upon knowing the difference between *Come, and Go!*"

THE FARMERS' CABINET,

AND

AMERICAN HERD-BOOK.

Philadelphia, Second Month, 1848.

From the following statements, it appears that United States flour is quite as cheap in Liverpool as in our own city. It is difficult to comprehend, why, with our abundant crops, and the prices abroad of bread stuffs, we should find our farmers able to obtain so ample a remuneration for their labours. Butter may be quoted at 25 to 30 cts. in our market, pork $6, and beef from $6 to $7.

"For the six weeks ending January 8, 1848. Sterling reduced to United States money, 24 cents to the shilling:

Wheat	$1 58
Barley,	93
Oats,	61½
Rye,	93
Beans,	1 34½
Peas,	1 40

N.B.—The bushel of wheat weighs 60 lbs., and the quarter of eight bushels 480 lbs. Oats, 45 lbs. per bushel.

"January 15th—Indian Corn at Liverpool was 32s. per quarter of 480 lbs.. equal to 96 cents per bushel of 60 lbs. Indian Meal per barrel of 196 lbs., 15s., equal to $3 60.

"U. S. Flour 28s. to 29s., equal to $6 72 and $6 96 per barrel."

Our friend, M. B. Bateham, of the Ohio Cultivator, will accept thanks for a copy of the *Transactions of the Nurserymen and Fruit Gardener's Convention*, held at Columbus, in the 9th month last. The discussions pertaining to the objects of the convention, were animated, and they concluded to adopt as a standard in the classification of fruits, Downing's work on the Fruits and Fruit Trees of America.

Frequent inquiries are made in relation to the mode of using Poudrette; and as the season for applying it is near at hand, it may be well to state for the information of such as have not hitherto become familiar with it—that when applied to the corn in the hill, about one gill is generally used; it may be dropped either before or after the corn, and covered up with it. In this way, 8 or 10 bushels are requisite for the acre, according to the distance of the hills of corn. When put on wheat broad cast, at this season of the year, from 20 to 40 bushels may be spread; and about the same quantity when applied in the fall, and harrowed in with the seed. Many applicants were unable to procure the Poudrette, last spring: we were unable to satisfy the demand. There is now a good supply on hand, though not to so large an amount as we had a year ago. It is suggested to our friends to apply early in the season; if it be postponed until near the period of using it, the throng is so great, that even if it can be procured at all, there is frequently, and of necessity, a considerable delay in forwarding it. For present prices, see the last page.

GUANO.

Peruvian & African Guano, in bags & bbls.

ALSO, PREPARED GUANO.

This article has been in use during the last year, and from the effect that it has produced, can be safely recommended to farmers as a cheap and valuable fertilizer; the object in preparing this article is to give the farmer a manure at a very low price, that will enable all to use it. It is prepared upon strictly scientific principles, and is recommended to general use by the *Farmers' Club, and the New York State Agricultural Society.*

For Sale by ALLEN & NEEDLES,
23 South Wharves, near Chesnut Street, Phila.
Feb. 15th, 1848.—6m.

NORMAN STALLION.

THE subscriber being about to quit the business of farming, offers at private sale, the thorough-bred Norman Stallion "Norman." Norman was raised by Edward Harris, Esq., of Burlington county, N. J., and was four years old last July. He was sired by Diligence, from a full-blood Norman mare, which Mr. Harris imported at the same time. He is a beautiful dapple grey, and measures 15 hands, possesses all the good points of his celebrated sire, and resembles him very closely. It is unnecessary to comment on the valuable properties of this breed, so well known as combining more action and speed with great strength, than any other race of horses in Europe or this country. It is sufficient to say that this race is the progenitor of the Canada horse, and is in fact the same horse on a large scale.

Norman is one of only four thoroughbreeds that Diligence has begotten, and it is believed he will bear comparison with either of his brothers. Persons desirous of purchasing, and not wishing to go so far from the great lines of travel to see the horse at my residence, before they know the qualities of the breed, can get every information about the stock, and see several of the imported horses at the farm of Mr. Harris, as above, which is only nine miles from Philadelphia, who is acquainted with my terms, and has been kind enough to authorize this reference.

RICHARD C. HOLMES,
Cape May Court House, N. J.

Jan. 31st, 1848.

SEED STORE,

No. 23 Market Street, Philadelphia.

The subscriber keeps constantly a supply of White and Red Clover, and other grass seeds; fresh Perennial Rye-grass, and Lucerne seed. Field seeds, consisting of choice Spring Wheat, Barley, Potatoe Oats, Northern and other seed-corn. Also, in season, Fruit and Shade Trees. Garden and Bird seeds generally. Guano in parcels to suit purchasers.

M. S. POWELL.

Philad., Feb., 1847. tf.

Agency for the Purchase & Sale of

IMPROVED BREEDS OF CATTLE & SHEEP.

THE subscriber takes this method of informing his friends and the public, that he will attend to the purchase and sale of the improved breeds of cattle, sheep, swine, poultry, &c., for a reasonable commission. All letters post paid, addressed to him at Philadelphia, will be attended to without delay.

AARON CLEMENT.

April 15th, 1847.

COAL.

THE subscriber has made an arrangement for a constant supply of superior Lehigh and Schuylkill Coal—carefully prepared for family use, which he will furnish *at the usual cash prices*, on application at the office of the Farmers' Cabinet, where samples of the different kinds and sizes may be seen.

JOSIAH TATUM.

Philadelphia, Seventh month 15th, 1847.

NEW

Horticultural and Agricultural Ware-house,

84 Chesnut Street below Third, South side.

The subscriber has for the better accommodation of his customers, opened the above ware-house, with a large stock of Garden and Field Seeds, crop of 1846. Implements and Books on Gardening and Farming; he calls the particular attention of farmers to his pure stock of Sweede Turnips, Field Carrots, Beets and Parsnips, Pruning Shears, Saws and Knives.

March 14th, 1847.—1y. R. BUIST.

COATES' SEED STORE,

No. 49 Market Street,

FRESH TIMOTHY SEED,

Of various qualities, from good common seed to the purest and finest that can be produced,

TOGETHER WITH A COMPLETE ASSORTMENT OF

GRASS & GARDEN SEEDS,

Of the finest Quality and best Varieties,—Bird Seeds, &c.

JOS. P. H. COATES,
Successor to George M. Coates.

May 15th, 1847.

PREMIUM IMPLEMENTS.

PROUTY'S Improved Machine for Shelling and Screening Corn, and Separating it from the Cob.

For this Machine the Philad'a Agricultural Society awarded their first Premium for Corn Sheller, 1847.

Grant's Patent Premium Fan Mill,

For Chaffing and Screening Wheat, at one operation. Three Silver Medals, and nine First Premiums, have been awarded for the above Mill.

Prouty and Mears' Patent Centre-Draught, Self-Sharpening Ploughs. First Premium awarded for these Ploughs, by the Philadelphia Agricultural Society, 1844, 1845, 1846 and 1847.

Corn and Cob Breakers and Grinders,

Corn Stalk Cutters & Grinders—Sugar Mills—Spain's Improved Barrel Churn, the dashers of which may be taken out to clean. Also, a full assortment of Agricultural Impliments, Manufactured and for Sale by

D. O. PROUTY,

No. 194½ Market Street, below Sixth, Phildelphia.

Nov. 15, 1847.—tf.

☞ SHORT ADVERTISEMENTS,

The subject matter of which, may correspond with the agricultural character of this paper, will be inserted at the rate of one dollar for each insertion of ten lines or less; and so in proportion for each additional line. Payment in advance.

THE quantity of rain which fell in the 1st month 1848, was ..... 2.30 in.

Penn. Hospital, 2nd mo. 1st.

We keep on hand at this office, and will supply our friends with Agricultural works generally. Among which are

THE FARMER'S ENCYCLOPEDIA, full-bound in leather;—Price	$3 50
YOUATT ON THE HORSE, with J. S. Skinner's very valuable Additions;	2 00
BRIDGEMAN'S GARDENER'S ASSISTANT;	2 00
THE AMERICAN POULTRY BOOK;	37½
THE FARMER'S LAND MEASURER;	37½
DANA'S MUCK MANUAL;	50
Complete sets of the FARMERS' CABINET, half-bound, 11 vols.	9 50
DOWNING'S Landscape Gardening,	3 50
Downing's Fruits and Fruit Trees of America,	1 50
SKINNER'S Every Man his own Farrier,	50
AMERICAN Poulterer's Companion,	1 25
BOUSSINGAULT'S RURAL ECONOMY,	1 50
FARMERS' & EMIGRANTS' HAND-BOOK,	1 00
MORRELL'S AMERICAN SHEPHERD,	1 00
STABLE ECONOMY,	1 00
BEVAN on the HONEY BEE,	31¼
BUISTS' ROSE MANUAL,	75
THOMAS' FRUIT CULTURIST,	50
SKINNER'S CATTLE & SHEEP DOCTOR,	50
AMERICAN FARRIER,	50
THE FARMER'S MINE,	75
HOARE ON THE VINE,	62½
HANNAM'S Economy of Waste Manures,	25
LIEBIG'S AGRICULTURAL CHEMISTRY,	25
" ANIMAL CHEMISTRY,	25
" FAMILIAR LETTERS,	12½
JOHNSON'S DICTIONARY OF MODERN GARDENING,	2 25

Subscriptions received for Colman's Agricultural Tour—or single numbers sold.

☞ We are prepared to bind books to order.

AFRICAN GUANO.

First quality African Guano, from the island of Ichaboe, warranted genuine. Also a few tons Peruvian

For sale by J. B. A. & S. ALLEN,
No. 7 South Wharves, 2nd Oil Store below Market street.
Philadelphia, March 17th, 1847.

Poudrette.

A valuable manure—of the best quality, prepared in Philadelphia, for sale at the office of the Farmers' Cabinet, No. 50, North Fourth Street, or at the manufactory, near the Penitentiary on Coates' street. Present price, $1 75 per barrel, containing four bushels each, or 35 cents a bushel. Orders from a distance, enclosing the cash, with cost of porterage, will be promptly attended to, by carefully delivering the barrels on board of such conveyance as may be designated. The results on corn and wheat have been generally very satisfactory. Farmers to the south and in the interior, both of this State and of New Jersey, are invited to try it. We are now ready to supply any demand for wheat.

JOSIAH TATUM.

Philada. 8th mo. 16th, 1847.

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Terms.—One dollar per annum, or five dollars for seven copies—*payable in advance.*

All subscriptions must commence at the *beginning* of a volume. Having lately struck off a new edition of one or two of the former numbers, which had become exhausted, we are now able to supply, to a limited extent, any of the back volumes. They may be had at one dollar each, in numbers, or one dollar twenty-five cents half-bound and lettered.

For eight dollars paid in advance, a *complete set* of the work will be furnished in numbers, including the 12th volume. The whole can thus readily be forwarded by mail. For twenty-five cents additional, per volume, the work may be obtained neatly *half-bound and lettered.* Copies returned to the office of publication, will also be bound upon the same terms.

By the decision of the Post Master General, the "Cabinet," is subject only to newspaper postage.

Joseph Rakestraw, Printer.